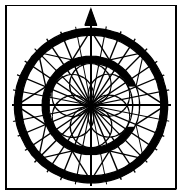

CHEMONICS INTERNATIONAL INC.

NICARAGUAN AGRICULTURAL RECONSTRUCTION ASSISTANCE PROGRAM (ARAP): FINAL REPORT

A Task Order Under the RAISE IQC

Contract No. PCE-1-00-99-00003-00

Task Order No. 802

Submitted to:
USAID/Nicaragua

Submitted by:
Chemonics International Inc. • The Texas A&M University • J.E. Austin Associates

May 24, 2002

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ACRONYMS

AGROPSCA	Agropecuario El Cacao
AMDES	Asociación de Mujeres en Desarrollo (Association of Women in Development)
AMSPT	Asociación Misión San Pablo de Tarso
ANIMAR	Asociación Nicaragüense de Marañon (Nicaraguan Cashew Growers Association)
APEGARO	Asociación de Pequeños Ganaderos de Rosita (Association of Livestock Producers of Rosita)
APENN	Asociación Nicaragüense de Productores y Exportadores de Productos No Tradicionales
APHIS	U.S. Department of Agriculture Animal Plant Health Inspection Service
ARAP	Agricultural Reconstruction Assistance Program, Nicaragua
CANISLAC	Cámara Nicaragüense de Lácteos
CRI	Cooperative Resources International
COMJIMILF	Cooperativa de Mujeres Jinoteganas Mil Flores
CONOR 3-80	Cooperativa Multisectorial del Norte Frente 3-80
ECAGE	Escuela Católica de Agricultura y Ganadería de Estelí (Catholic School of Agriculture and Livestock in Estelí, Nicaragua)
EXITOS	Export Industry Technology Support Project
FADCANIC	Fundación para la Autonomía y Desarrollo de la Costa Atlántica de Nicaragua
FAGANIC	Federación de Ganaderos de Nicaragua (Nicaraguan Ranchers Federation)
FHIA	Fondo Hondureño de Investigación Agrícola (Honduran Foundation for Agricultural Research)
IICA	Inter-American Institute for Cooperation in Agriculture
INTA	Instituto Nicaragüense de Tecnología Agropecuaria
LYD	Lethal Yellowing Disease of Coconuts
MAG-FOR	Ministerio de Agricultura y Forestal (Nicaraguan Ministry of Agriculture and Forestry)
MARENA	Ministerio de Recursos Naturales y Medio Ambiente (Ministry of the Environment)
PAC	Pueblos en Acción Comunitaria

PACD	Project Activity Completion Date
PIO	Public International Organization
PMA	Produce Marketing Association
PROEXAG	Nontraditional Export Support Project
PROVIA	Programa de Fortalecimiento del Sector Privado para la Formulación de Políticas Agrícolas
RAAN	North Atlantic Autonomous Region
RAAS	South Atlantic Autonomous Region
RAISE	Rural and Agricultural Incomes with a Sustainable Environment
UNA	National Agrarian University
UNIFLORA	Unión Nacional de Floricultores (National Union of Flower Producers)
UPANIC	Unión de Productores Agropecuarios Nicaragüenses (Union of Private Agricultural Producers of Nicaragua)
WHO	World Health Organization

Executive Summary

Hurricane Mitch severely affected Nicaragua's agricultural sector, particularly in the north and northwest sections of the country. The Government of Nicaragua estimated total damage in excess of US$250 million in the sector; livestock, basic grains production and on- and off-farm infrastructure were the most severely impacted. More than 25 percent of the country's cropland was damaged and eroded by flooding. Many successful producers went bankrupt, with limited options for securing financing to help rebuild operations. In particular, the small farmer — the future of Nicaragua — suffered greatly. Despite the serious 1997-98 El Niño drought, Nicaragua's agriculture sector had been performing well, achieving an 8.5 percent growth rate in 1997. However, as a result of Mitch, the agricultural growth rate fell to only 4 percent in 1998.

ARAP at a Glance

ARAP was financed by USAID under the RAISE IQC. The task order (TO) was awarded to Chemonics on January 10, 2000 and had an end date of December 31, 2001. Chemonics' RAISE Consortium members — Harza Engineering, J.E. Austin Associates, Midwestern Universities Consortium for International Activities, Inc., Prime International Inc. and Texas A&M University Systems — participated in the TO. ARAP's total budget was $6,798,042 and was fully spent. An estimated 7,533 person days of services were delivered during the 23-month life of project.

The USAID/Nicaragua Agricultural Reconstruction Assistance Program (ARAP) was designed to provide a rapid-response, demand-driven assistance program furnishing strategic technical assistance and funds to local organizations (non-governmental, producer associations, and cooperatives) in Hurricane Mitch-impacted areas, primarily centered in the northern one-third of the country. ARAP's purpose was to help both small and medium-sized farmers recover from the impact of Hurricane Mitch. The project succeeded in expanding and diversifying farmers' market and production capability to ensure their long-term growth and competitiveness as well as mitigate their vulnerability to other potential natural disasters. Specifically, ARAP was charged with providing "*technical assistance in the agribusiness area to promote market linkages, increase the presence of high-quality Nicaraguan agricultural products in the external markets, promote co-investment arrangements and help create a better business environment for local producers.*"

This objective was accomplished by using a long-term team of local agricultural promoters supported by long- and short-term experts in agribusiness, marketing, policy and grant management. ARAP's implementation methodology focused on identifying market opportunities for producers in the affected region and using special activity funds (primarily grants), strategic technical assistance, timely, accurate market information, as well as other mechanisms to connect producers with market opportunities.

Despite its short time frame, ARAP achieved many significant results, laying the groundwork for the reactivation and expansion of the Nicaraguan agricultural sector. A total of 20 grants and subcontracts worth $2.8 million were disbursed during the life of the project, benefiting more than 18,000 families. These programs, which supported market-led initiatives in a number of agriculture-related sectors, have made a lasting impact on Nicaragua's agriculture sector, helping

small farmers recover lost income, diversify production to reduce risk, and work to lift themselves out of the persistent poverty that has characterized Nicaragua's recent economic history.

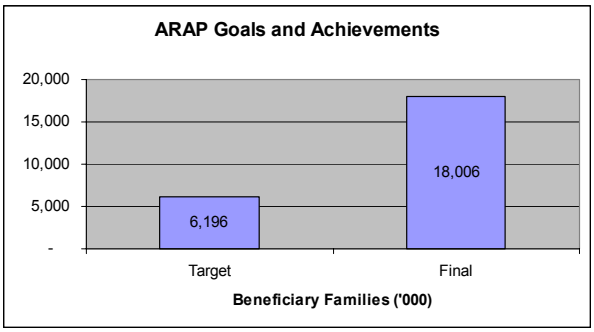
The Key to Success:
ARAP Project Diversification (Grants Disbursed)

-UNA-Fruit Fly Study
-Improved Coconut Germplasm Introduction Project (LYD)
-Fair-Trade/Organic Cocoa Marketing Project
-Small Producer Livestock Project (APEGARO)
-AMSPT, Vegetable and Grain Production and Marketing
-Sweet Onion Export Project (AGROPCSA)
-Coffee Roasting & Marketing Project
-Livestock Improvement and Marketing Project (UPANIC)
-Covered Crop Vegetable Project (AMDES)
-Potato Production and Marketing Project (ECAGES)
-Light Industry Project (PILA)
-2001 Drought Relief Program
-Exotic Tropical Fruit Introduction Program (PAC)
-Conventional Cacao Quality Improvement Program
-Local Honey Industry Analysis
-Multifaceted Agricultural and Livestock Project (Conor 380)

Single-parent households and Atlantic Coast ethnic communities were among the 18,000 beneficiaries of ARAP's focus. Approximately 27 percent of the project beneficiaries were households in which women were the only or main breadwinners. The majority of the women were involved in small animal husbandry, horticulture/floriculture and processing projects. ARAP supported producers groups made up only of women such as the COMJIMILF floriculture project and the sweet onion export project that was comprised of two cooperatives, of which one, the Lionel Valdivia, had only one woman member, its president.

Environmental consideration. The ARAP team reviewed general environmental impact issues before undertaking activities under grants and subcontracts. However, a formalized reporting system was not put into place. Parenthetically, USAID/Nicaragua did not have guidelines specific for Nicaragua until late into the project. Notwithstanding, for grants and subcontracts where environmental impact was either obvious or a possible hindrance to the sustainability of the grant or subcontract activity, the technical team discussed their concerns and solutions with the CTO and the Mission's environmental officer before taking any actions.

ARAP was the only project that supplied total coverage to the Northern Atlantic Autonomous Region better known as RAAN. In this area, where projects were reached by full-day vehicle trips or seven-hour boat rides, ARAP worked hand in hand with the local ethnic groups; Miskitos, Mayangnas, Mestizos and Afro-Nicaraguans accounting for more than 2,000 households benefited in the area. Livestock production, artificial insemination programs, introduction of new crops, cocoa production and the introduction of resistant varieties of coconuts through the Lethal Yellow Disease Project led ARAP to become the foremost representative of USAID in the area.



The success of ARAP was based on using the particular strengths of the producer groups, identifying market opportunities and providing the producers the tools needed to supply the demand, which translates to increased revenue for the producers.

Sales in excess of $9 million for more than 18,000 beneficiaries during the life of the project. These figures translate to a ratio of $1.32 in sales per $1.00 in contract costs during the reporting life of ARAP. Consistent with any business development activities, it is natural to expect results to be greater in out-years than at inception.

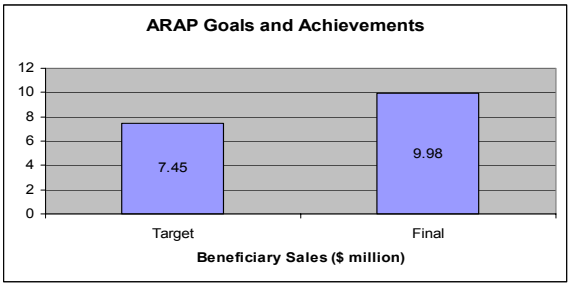
A common rule of thumb for any productive/marketing activity running five years is as follows:

Sales:	$5 for each $1 invested
Employment:	1/3 person-day for each $1 invested
Physical Investment:	$.50 for each $1 invested

With anticipated sales of at least $2 million alone from dairy and high-value horticulture during 2002, and anticipated annual continuance of these figures, one could extrapolate that ARAP-initiated activities could generate more than $35 million in sales by 2004. It is clear that ARAP was a very good contract for Nicaragua, USAID and indirectly U.S. taxpayers, achieving results in excess of its contract value — results that will continue long after project closure.

Significant amounts of emergency grant aid distributed in a rapid, effective, and accountable manner. An estimated $2.8 million in grants and other special activities were distributed to more than 20 different agencies and activities representing more than 18,000 beneficiary households. In addition, at USAID's request, ARAP supported an emergency relief program for people affected by the drought in 2001, providing assistance through the donation of tools and other material to more than 5,000 persons in a food for work program.

Export markets to United States reactivated. One key success story was in the area of sweet onions. ARAP worked with 54 farmers in the Sébaco Valley to re-open commercial linkages lost after Mitch. Exports to U.S. companies, such as Keystone Marketing, were valued at more than $950,000 for the first planting cycle. With market linkages firmly established, exports should continue on a sustainable basis in future years, with 2002 acreage up to 70 manzanas and the number of producers up 70 percent, implying sales of more than $1 million for 2002. This specialized industry is now back on its feet after being decimated by Hurricane Mitch and is generating sizeable, consistent, and sustainable income for farmers in the Sébaco Valley of Nicaragua.



Marketing linkages strengthened. In the dairy sector, for example, ARAP identified new regional market opportunities for dairy products, in particular Nicaraguan hard cheeses (morolique), and helped improve sanitary practices and conditions. Of crucial significance, ARAP helped five Nicaraguan dairy plants achieve export certification, subsequently enabling them to export more that 838,000 pounds of cheese valued at more than $1 million to Honduras and El Salvador in 2001 alone. These solid linkages will help secure the continued employment of more than 5,900 dairy workers, plant owners, and ranchers that currently supply raw milk to processing plants while the improved hygienic practices will improve product quality and reduce

the incidence of food-borne illnesses. In addition, ARAP provided extensive assistance to the livestock sector in improved insemination, feeding, fertility testing, and breeding techniques.

Introduction of both short- and long-term alternative cropping options. ARAP introduced long-term cropping alternatives such as lychee, longan and rambutan — all exotic, high-value crops with significant future export potential — as well as short-term, quick-return crops such as sweet corn. ARAP validated with world seed companies ASGROW, PETOSEED and Sakata Seed more than 83 different varieties of vegetables. Under ARAP's guidance, 41 manzanas of cashew have been planted with high-quality improved seed, and 60 more are slated for planting in 2002. ARAP also helped to establish a new Cashew Association to assist in the expansion of this high growth, high market-demand cash crop. These options and the exotic tropical fruits, many of which will be planted in the economically depressed coffee belt, will provide significant income streams for many years after ARAP's end.

ARAP-supported onion growers in the Sébaco valley prepare seedbeds for transplanting. ARAP worked with growers to re-establish their market contacts with U.S.-based fresh produce marketers, contacts that had been broken by Hurricane Mitch.

Market price information now available on a timely, accurate basis. Under a unique subcontracting arrangement with the Fundación Hondureña de Investigación Agrícola (FHIA), a marketing information system has been put in place to ensure reporting of local fresh produce prices in perpetuity. This continuing system not only allows access to vital market data but also serves as a mechanism for strengthening the Non-Traditional Producers and Exporters Association (APENN), an organization that acts as the local clearinghouse for this data. Sales of subscriptions to the market information will provide revenue to sustain and expand APENN's market development programs.

New technologies introduced to provide high-value fresh produce. ARAP's introduction of new technologies, such as protected cropping (hoop tunnels), has resulted in the cost-effective, continuous production of tomatoes, green peppers, and other high-value products to help meet counter-seasonal market demand, both regionally and internationally.

New market outlets promoted. ARAP helped identify several agricultural products with a promising future in Nicaragua. Of particular note is the ornamental flower industry. In addition to establishing the first Nicaraguan Union of Ornamental Flower Growers (UNIFLORA), ARAP also helped organize the first-ever Nicaraguan Flower Show, which is now held at least twice a year, independent of ARAP assistance. ARAP also helped to finance the importation of improved genetic material for ornamental flowers from Costa Rica and promoted new methods of flower cultivation and market research. The group eventually hopes to export to the United States, although satisfying local demand is currently keeping the group very busy. To date, they have generated more than $75,000 in new sales.

A final comment is required on the sustainability of ARAP initiatives. Though ARAP ended in December 2001, many activities have continued to generate results and improve the standards of living for Nicaraguan farmers impacted by Hurricane Mitch. Highlights include:

Sustainable dairy sales. On February 18, 2002, Lácteos Santa Marta inaugurated a new dairy plant in Jinotega. ARAP was instrumental in assisting Santa Marta obtain the initial $127,000 funding for this plant. In addition to representing new sales and income for 15 new producers supplying 2,000 liters/day of milk, the plant will help sustain ARAP-introduced new sales of parmesan cheese to Pizza Hut Honduras (4,000 lbs per month at $1.60/lb), local supermarket sales of Provolone, and potential new products such as Baby Gouda, Manchego and Port Salut. Most importantly, Lácteos Santa Marta is in contact with Cysco Supermarkets in Florida and has sent samples to distributors in California in an effort to tap unmet ethnic market demand for diary products in the United States.

Hygienic conditions in dairy processing were a focus of ARAP. Support included technical assistance and publication of Nicaragua's first dedicated Best Manufacturing Practices manual for the dairy industry.

First-time sales of Fair Trade Organic Cacao. Pro-Mundo Humano and Cacaonica exported their first three containers of Fair Trade Cacao to Germany, Holland and Costa Rica in February 2002. This sale, valued at $80,000, is the first shipment of a potential 100 ton order. Benefiting the 351 members of Cacaonica, the $1,750/ton price paid represents a premium of $500/ton over current world prices. Additionally, Pro-Mundo Humano has signed an agreement with GTZ and the German purchaser, Ritter Co., to help finance the fair trade and organic certification of an additional 400 producers in 2002 and 2003, bringing the total number of certified cacao producers to 751.

Sustainable presence in new markets. AGROPCSA, the Sébaco Valley sweet onion producer cooperative, has continued to export to alternative markets for the 2002 season. To date, AGROPCSA has exported 7,000 bags to Costa Rica at $19.00/bag (well over the U.S. market price), and has sold 4,000 bags of smaller boiler and pre-packed onions in the local market for $15.75/hwt. MANPROSA, the largest producer in the valley, continues to maintain marketing contracts with Keystone Marketing Inc. of the USA, a *relationship developed as a direct result of ARAP*.

Continued lethal yellow coconut activity. In response to the ecological and economical threat posed by this coconut tree disease, ARAP, together with USAID, IICA/USDA, MAG-FOR and FADCANIC, helped introduce 17,000 resistant coconut seeds and seedlings into 40 communities in the North Atlantic Autonomous Region (RAAN), one of the poorest regions in the country. Under a new effort financed by the PL-480 Secretariat and with the assistance of FADCANIC, lethal yellow disease-resistant coconut nurseries are being established in 50 additional communities. In conjunction with the Instituto Nicaragüense de Tecnología Agropecuaria, a

harvesting and processing facility for coconut pollen has been established to expedite the delivery of disease-resistant hybrids on a nationwide basis.

Continuity of activities through USAID partners. The ARAP-assisted Cooperativa Río Grande de Cardamomo Orgánico has entered into an agreement worth $115,000 with Winrock International to increase planting area, finance additional organic certification, and construct additional drying and processing facilities for organic cardamom. Cooperative members traveled to Guatemala to meet with spice buyer Multiexport, which has offered to buy their production at $12.00/kg due to the high quality of the samples submitted.

The ARAP project was clearly one of USAID/Nicaragua's most successful interventions in the wake of Hurricane Mitch. It not only helped to reactivate and rehabilitate destroyed agricultural sectors, but it also set the stage for significant expansion of the entire sector, particularly in essential, high-demand market areas. The project activities have already had significant and sustainable impacts on a large number of both direct and indirect beneficiaries; while not solely attributable to ARAP, Nicaragua was able to achieve an 8.4 percent growth rate in the agricultural sector in CY 2000, almost equal to that of 1997, before Hurricane Mitch. This impact continues — while CY 2001 agricultural sales data are not yet available, it is predicted that totals will far exceed expectations. Nicaragua's agricultural sector is back in business and ARAP's influence is sure to be felt in the coming years as the country continues to recover. Funds instrumental in this recovery were carefully managed, having already exceeded industry standard rates of returns on sales per investment. Farmers who watched as their livelihoods were swept away in 1998 now see better living conditions and the prospect of continued improvement due to ARAP's initiatives in generating market opportunities through enhanced and diversified farming methods, thereby raising the quality of agricultural products. Lessons learned and recommendations for similar projects in Nicaragua have been incorporated in the final report and in the chief of party's end of tour report.

Agricultural Reconstruction Assistance Program: Final Report

I. Introduction

Hurricane Mitch wreaked havoc on large swaths of northern and western Nicaragua when it moved through Central America in October 1998. Significant losses in income, productive assets and human resources were experienced in countries that were ill-equipped to deal with them. In Nicaragua, losses were estimated at $1.5 billion, with 3,000 people dead and over 11,500 hectares of agricultural land hard hit by the storm. In response to this emergency, the U.S. Congress authorized USAID/Nicaragua to undertake a series of reconstruction activities dealing with a variety of sectors, including agriculture. In December of 1999 a Chemonics-led consortium was awarded a two-year, $6.7 million contract to implement the Nicaraguan Agricultural Reconstruction Assistance Program, known by its acronym ARAP, under the Rural and Agricultural Incomes with a Sustainable Environment (RAISE) Indefinite Quantity Contract.

Among the many challenges facing the ARAP team when field work initiated on the contract in February 2000, three stood out:

1. *The market:* approach each situation from the view point of market orientation. Is there a readily identifiable market for the product? Is the product currently produced? Are there niches that have not been explored? Are there alternative markets that will provide a better price or is there a technological process that can add value for an existing market? Prior experiences had indicated to USAID/Nicaragua that a "supply side" solution to agriculture where increases in production were automatically assumed to be absorbable by the market had proved inaccurate. Furthermore, emphasis on traditional small holder crops such as rice and corn were proving to be poor mechanisms for lifting the rural populace out of poverty. There had to be a way to combine market-oriented agriculture with higher-value alternatives.

2. *Develop a mechanism for the rapid disbursement of significant grant-type funds to organizations that may or may not have an adequate installed capacity to manage such financing.* Balancing both development goals such as avoiding the entitlement mentality with the timely provision of goods (inputs) and services to needy rural groups would require a combination of institutional strengthening and support, creative mechanisms for direct transfer of productive assets, and close supervision by ARAP staff to ensure accountability of U.S. taxpayer money.

3. *Achieve and report effective results during the short time frame of the project.* Agriculture in Central America has three defined growing seasons per calendar year for products such as basic grains. However, many crops, in particular the higher-value non-traditional products, have a time frame of three to five years or more. Would USAID allow the ARAP to pursue such post-Project Activity Completion Date (PACD) projects? Would beneficiaries be able to care for these projects post-ARAP? Were there short-term alternatives to basic grains that would produce positive results? The issue of sustainability,

always crucial to development efforts, would be critical given the short time frame for action.

These were the primary questions that the team faced. This report will allow the reader to make a determination as to the success of ARAP in meeting each of these challenges.

II. ARAP Impact

A. Impact

The ARAP project worked to improve the lives of rural producers hit by Hurricane Mitch by identifying market opportunities that would allow them to achieve a sustainable increase in sales and income by generating new sales opportunities for them. This section will review the actual impact the project had on its beneficiaries, follow with a discussion on mistakes avoided in determining sector priorities, and carry out an in-depth review by sector of ARAP's work.

ARAP worked under the framework of USAID's Hurricane Mitch indicator:

2.0a Number of Households that Receive Benefits from USAID
2.1a Number of Households in Mitch Areas Adopting Sustainable Agricultural Practices

In addition, ARAP team members recommended to USAID that the project track sales resulting from marketing activities. The team tracked results using a variety of systems. Though an initial monitoring and evaluation system set up in 2000 was made obsolete by changes in mid-year to the indicators, USAID decided to track for Hurricane Mitch programs. Results were gathered directly from ARAP professional staff and by sub-grantees working with support of ARAP staff. Periodic verification checks were made *in situ* to ensure the quality of the numbers provided, both in terms of beneficiaries and in terms of sales. Only in the cases of emergency drought relief did ARAP rely exclusively on numbers provided by USAID PVO partners in determining estimates of project beneficiaries.

Summary of Results:

Number of Households Benefiting from USAID Activities Via Adopting Sustainable Agricultural Practices

Planned	Achieved
6,196	**18,006**

Through its highly successful dairy initiatives, cacao programs, drought relief efforts and other sector work, ARAP exceeded its planned targets by nearly 300 percent. ARAP benefited families in 724 communities spread over 54 municipalities (71 percent of the total municipalities in Mitch-affected areas) in the 8 departments designated by USAID as Mitch-affected. Assuming an average of five persons per beneficiary family, the total amount of people directly or indirectly impacted by ARAP initiatives is estimated at **over 91,000**.

Sales of Agricultural Goods by ARAP-Supported Beneficiaries Resulting From ARAP Interventions

Planned	Achieved
$7,465,000	**$ 9,987,000**

The sales figures are ARAP estimates based on information provided by producers and other beneficiaries. It is important to note that these figures are for the life of the ARAP project only: for many products ARAP beneficiaries will not see initial sales figures until 2002 or beyond, in particular for the exotic tropical fruit sector, cashews, and livestock. And many ARAP programs with current sales will continue to generate these sales well into the post-ARAP future.

Additional Results

Not only did ARAP work toward the primary goals of the USAID Hurricane Mitch reconstruction program, it also worked in a number of areas related to Nicaraguan agriculture which directly or indirectly supported the project's activities. These include the following:

Business Deals Supported (EXPO-APENN) $1,347,000

ARAP provided crucial financial backing to EXPO-APENN, the Nicaraguan non-traditional agricultural export fair. According to APENN, over $1.3 million in deals were secured for Nicaraguan companies at the fair. Without ARAP support it is doubtful that the EXPO would have been carried out.

Private Sector Loans Mobilized (Value, US$) $320,000

Under ARAP, private sector financing for dairy plant construction/rehabilitation was obtained for two companies based on a business plans drawn up under the guidance of ARAP consultant Celia Maria Morales.

Crop Diversification 24 Non-Traditional Crops Covered by ARAP

Under ARAP several production alternatives, both traditional and non-traditional, were identified for producers interested in diversification. Improved cashew, exotic tropical fruits such as lychee, longan, rambutan and mangosteen, a wide variety of spices, sweet corn, ornamental plants and tilapia, all received attention from ARAP. Sweet potato varieties recommended by the International Potato Center (CIP) in Peru were planted in Rosita and have gained great acceptance as forage, livestock feed, and most recently for human consumption. Three different varieties of potato seed (white and red) have been introduced via the Catholic School of Agriculture and Livestock (ECAGE), and seven different culinary herbs provided by Graiff Farms, New Jersey, have been introduced on a trial basis for possible contract farming for export to the United States.

Seed Trials Conducted **4 Separate Seed Trials Undertaken With Private Companies**

In conjunction with private sector seed companies (Sakata Seed, ASGROW, Petoseed) 55 varieties of onion (sweet, red, white, yellow) and 24 different vegetables were subjected to trials with ARAP growers. This work is laying the foundation for the identification of improved varieties suited to Nicaraguan conditions and will help Nicaraguan producers to remain competitive in terms of market-required varieties.

Introduction of Livestock and Crop Production Technologies

ARAP introduced many new and/or improved technologies in both the livestock and the agriculture fields. These included:

Agriculture

- Low plastic tunnels and high tunnels for protected cropping of high-value vegetables.
- Trellises for improved melon and cucumber production
- Drip irrigation for sweet onions (ARAP supported a 40 mz system, which is now the largest irrigated vegetable plot in Nicaragua)
- Post-harvest technology for rice processing, coffee drying and roasting

Livestock

- Electro-ejaculation and fertility testing equipment: a new cost-effective technology to rapidly improve herd genetics through identification and culling of poor-quality sires. Improved swine varieties
- Genetically superior cattle semen for artificial insemination (in particular leveraging donation of 5,000 straws of semen by the American Brahman Breeder Association)
- Mineral blocks as feed supplements to reduce nutrient deficiencies
- Improved pastures for animal nutrition

Products Commercialized, National Markets

ARAP-supported beneficiaries were able to successfully market a number of products to national supermarket chains and hotels. Products included tomatoes, sweet corn, white and red potatoes, cucumbers, squash, melons and several types of cheeses including provolone, mozzarella, parmesan and string cheese. Processed products successfully supported by ARAP included pickled vegetables, potato chips and high-quality cacao for *pinolillo* mix.

Products Exported

ARAP successfully supported the export of several products to regional and international markets. The following products were exported by country:

United States: Sweet onions (conventional, organic); cheese, coffee (conventional, organic)
Germany: Organic cacao
Switzerland: Organic cardamom
Guatemala: Onions, potato chips
Costa Rica: Onions
El Salvador: Onions, cheese, red beans, potato chips
Honduras: Cheese, cacao, onion, cardamom, potato chips

B. Mistakes Avoided

A key to achieving successful, sustainable results was to learn from previous experiences and avoid mistakes that would have cost ARAP time and resources. ARAP was able to access many key individuals in USAID/Nicaragua and from USAID/Nicaragua's partner organizations and discuss with them successful and not so successful prior interventions. This access allowed the project to avoid several pitfalls that had befallen others, saving the project resources and time. Without the openness of all the actors in the Hurricane Mitch recovery program, many mistakes

could have been repeated by ARAP, and the project is grateful for their cooperation and communication.

By focusing on market opportunities and market-driven activities, ARAP avoided three potentially significant mistakes during project implementation.

1. *A focus on low-value "poverty" crops*. Basic grains such as rice, corn and beans play a significant role in household food security and should be dealt with under food security programs. Their potential to raise incomes and lift people out of poverty is minimal, as their commodity status puts them in direct competition with highly productive producer countries such as the U.S. By focusing on low-value crops with low-productivity workers (few farmers in Nicaragua possess the machinery to produce on scale), ARAP would have been unable to help producers achieve real increases in incomes and sales from agricultural activities.

ARAP-supported onion growers in Sébaco valley prepare seedbeds for transplanting. ARAP worked with the growers to re-establish their market contacts with U.S.-based fresh produce marketers, contacts that had been broken by Hurricane Mitch.

2. *An emphasis on ARAP-funded credit programs*. Credit programs have the advantages of being fast disbursing and capable of obligating large amounts of resources in a short period. However, their appropriateness and effectiveness in a disaster relief situation is open to debate because of difficulties in recovering loans and the cost of supervision, especially where there are high delinquency rates. Credit programs often take significant time and effort to monitor, which distract resources better used elsewhere. To avoid getting involved in credit itself, ARAP worked instead to facilitate access to private sources of credit, arranging meetings between banks, Government of Nicaragua finance programs, and other donors with already existing credit programs. This allowed ARAP to leverage its scarce resources by linking small- and medium-sized firms to credit sources. For example, **as a direct result of ARAP support,** two dairy firms were able to secure financing for plant expansion from private banks working in conjunction with public sector guarantees after presenting rigorous, profit-based financial analysis.

3. *Rigidity in approach*. USAID Nicaragua allowed ARAP to pursue a variety of options, including some that will not have payoffs during the life of the project. This is especially true of some of the more innovative crops introduced by ARAP, such as high-quality cashew and exotic tropical fruits (lychee, longan, rambutan). ARAP is convinced that these crops have enormous future potential for Nicaragua in terms of income and employment generation. By allowing ARAP to mix long-term initiatives such as mangosteen (up to seven years for full production) and short-term activities such as sweet corn, protected cropping of vegetables and sweet onions, the project was able to balance immediate needs without sacrificing post-ARAP opportunities.

A final comment on approach. USAID Nicaragua studiously avoided typecasting the project as "export oriented" or "import substitution agriculture." If market conditions indicated that a crop currently imported could be produced at a lower price in Nicaragua, that crop was explored for possible actions. However, it was only viewed on the basis of market prices and profitability. Policy considerations such as proposing increased levels of protection were avoided. If new markets or improved marketing channels for exports were identified and justified, then the project worked to take advantage of them as well as domestic opportunities. The key was to go wherever the markets were.

C. Economic Impact

During the life of the project, no formal studies were done to determine its overall economic impact. This was primarily due to the short time frame of the project's operations and its focus as part of a reconstruction/relief activity designed to disburse quickly and have immediate impact. Nonetheless, ARAP contributed to laying the foundations for improvement in the rural economy of Nicaragua through the identification and pursuit of new opportunities. In addition to strengthening the Nicaraguan economy, certain activities had beneficial impacts on the economies of other nations. The example in Table 1 lays out probable distribution of benefits as a result of the ARAP sweet onion program. It shows substantial benefits accruing in the United States and to U.S. companies in connection with transport, repacking and sales services for the onions.

Table 1. Economic Impact, Sweet Onion Exports
(Based on an average 2000-2001 season price of U$20.00/50lb sack, using containers of 850/50lb sacks as a basis.

ITEM	COST (US$)	BENEFICIARY
Market Commission 17% sales price	3.40	U.S.
Re-packing/Re-grading	.50	U.S.
Custom Broker	.17	U.S.
Government Inspection	.17	U.S.
Transportation (DOLE)	4.00	U.S.
Customs Broker	.12	Nicaragua
Gov. Export Permits	.06	Nicaragua
Bag/Packaging	.20	Guatemala
Production/Admin	4.40	Nicaragua
TOTAL	13.02	
Net Profit per sack	6.98	Nicaragua

Income generated for U.S. company per sack = U$8.24
Income generated for U.S. companies by each container exported = U$7,000
Income generated for U.S. companies by ARAP assisted exports to U.S.= U$273,156
Benefit to final retailer U$20.00 x 15% or U$ 3.00
Total at retail: U$9,350 x 39 containers = U$364,650

Note that project activities were structured so that they would not compete with U.S. goods and services. No U.S. jobs were lost or put in jeopardy by ARAP activities. Indeed, as the example above shows, ARAP actually supported U.S. businesses. Under the tropical fruit sector, a private U.S. firm Artemis was willing to co-invest $5,000 with ARAP in a USAID-supported research activity carried out by Texas A&M because they foresaw a substantial future benefit.

Indirect economic impact. Decrease in illness, primarily through improved dairy standards for cheese and other processed products. The Nicaraguan Ministry of Health has estimated that 75 percent of the people who visit the nation's health clinics do so because of food and water-borne illnesses. For food-borne illness it is estimated that 75 percent of this is due to improperly handled and produced dairy products (WHO estimates that 85 percent of the focalized epidemics in the country were caused by consumption of cheese). By increasing the quality and safety of the products (both by plant improvements and by continual oversight for certification purposes),

there will be a measurable reduction over time of illness related to the consumption of these products. It would be useful for USAID to undertake such an analysis in the future to determine the economic impact of a reduction in food-borne illnesses for possible inclusion in future programmatic interventions.

D. Impact Areas and Sectors

ARAP activities were organized by sector or impact area. In each impact area we will describe the market justification for working in the sector, ARAP activities in each sector, actions taken, results achieved, and lessons learned.

D1. Livestock

The market justification for livestock is that Nicaragua has a strong tradition of cattle ranching and meat sales on a Central American and national level. Beef is the preferred meat though pork and chicken are also very popular. Fluid milk is consumed both in liquid form and for dairy products. In addition, Nicaragua possesses the most extensive grazing areas and best water supplies of any Central American country, giving it a comparative advantage in the production of livestock.

APEGARO technicians in Rosita carry out artificial insemination in cattle. ARAP provided training, technical assistance and institutional support to APEGARO to accomplish their livestock improvement project.

ARAP worked with three sub-grantees on livestock activities: The Union of Private Agricultural Producers of Nicaragua (UPANIC) in conjunction with the Cooperativa Santa Ana; the Association of Livestock Producers of Rosita (APEGARO); and the Cooperative Multi-Sectorial del Norte 380 (CONOR 380). Each project is described in detail below. ARAP's livestock sector interventions had significant successes, with over 1,100 head of cattle inseminated (calving in 2002) and over 400 manzanas of improved pasture and feedstuffs planted. The improved pasture included five types of grasses for pasture and silage, and four varieties of forage sweet potato. The sweet potato varieties were selected on the basis of site-specific recommendations by experts from the International Potato Center in Peru.

ARAP's work in the livestock sector focused on improving herd quality and nutrition. For beef breeds, improved genetics coupled with better nutrition allows the animal to reach optimal sales weight faster than the existing local breeds. Another part of the effort focused on improving local breeds' performance through better nutrition and management. For dairy breeds, better cow nutrition will increase milk production and allow the farmer to increase incomes through increased sales to consumers, dairy plants or other purchasers. This goal was attained by implementing a variety of actions whose focus was based on providing the producer more income faster by using and introducing new management and production technology as part of

an integrated production concept. Sales of semen, services and other activities brought in approximately C$2,865,000 (U$215,000) to the sector during 2001, and rotating fund replacement of animals through return of offspring added approximately C$471,500 (U$35,500) worth of in-kind livestock transactions.

To provide an expert underpinning of potential ARAP work in the sector, ARAP livestock consultants Dr. Ron Randel (a world authority on the Brahman breed) of RAISE subcontractor Texas A&M, and Dr. Robert Campbell of Kansas State University made visits to Nicaragua. Their recommendations in design and implementation of the sector's work were keys to ensuring that ARAP-assisted livestock farmers could increase their incomes through project interventions. Working in large part on the basis of their recommendations, the three ARAP-supported projects had similar technical components:

- Genetic improvement through artificial insemination
- Dry season feeding program, which included irrigated pastures, feeding the animals supplemental rations (converter), and the production and distribution of salt and mineral blocks to the herds.
- Construction of silage production and storage areas
- Veterinary assistance plus the training on electro-ejaculation of breeder bulls and bull viability semen evaluation.

ARAP adjusted the major technical components based on geographical and climatic differences and type of producer, focusing on rain-fed pastures and forages to take advantage of the abundant rainfall in the Rosita area, while emphasizing improved irrigation in the dry Chinandega region.

In response to demand from farmers, the ARAP project worked to install improved marketing capacity for the existing herd, both on the hoof and as meat. With ARAP support, sub-grantees UPANIC and APEGARO constructed two livestock holding and auction pens, which were in place and functioning in Somotillo, Department of Chinandega and Rosita, RAAN by project end date. In addition, using a design provided by ARAP, the sub-grantee APEGARO built a slaughter house and meat marketing center in the Rosita area.

The provision of local technical assistance also played a significant role in ARAP's support to the livestock sector. In addition to the two American consultants mentioned above, several other technicians played a key role in transferring know-how to the sector. Luis Piuzzi, a livestock project design specialist, worked with UPANIC and ARAP to ensure that the UPANIC sub-grant was technically sound and feasible. Two additional Nicaraguan consultants, Agusto Oporta and Martin Lacayo worked extensively with each of the sub-grantees. These experts provided timely assistance on a variety of technical matters and training issues that the sub-grantees themselves were unable to obtain.

UPANIC/SANTA ANA

Beneficiaries and location. This large sub-grant covered nine municipalities in the Department of Chinandega in northwestern Nicaragua. Of the nine municipalities, UPANIC managed activities in six, while the Santa Ana cooperative managed the other three. An estimated 1,926 households benefited directly from this project. At least 415 direct beneficiaries were women, who were the preferred recipients of improved breeds of hogs with the objective of providing the women with greater food and income security. The project received technical assistance both during project design (Luis Piuzzi and Ronald Randel) and during project implementation (Martin Lacayo and Agusto Oporta), allowing it to make significant progress toward its goals during the life of ARAP.

Cooperativa Santa Ana (Chinandega) technicians carrying out fertility testing under auspices of ARAP-financed training activity. The technology introduced in these tests mark the first time they have been used in Nicaragua outside the Ministry of Agriculture. This technology allows rapid determination of the health of a herd's bull, ensuring that reproductive potential of the herd is maximized.

Genetic improvements and sales: During the life of the activity, 998 cows were successfully inseminated by the project with 605 of the inseminations carried out with semen from beef breeds and 393 inseminated with semen from dairy breeds. Sales of these animals will bring the producers a projected $150,000 when they reach sale weight.

Another 552 improved hogs were distributed throughout the nine municipalities, directly benefiting 475 households. The first litters from the sows have shown improved weaning rates in comparison to local breeds (average litter size of 8 with improved breeds versus 4.7 with local breeds). These three additional hogs selling as adults for slaughter signify an extra C$3,000 per ARAP beneficiary or if sold as feeder pigs an additional C$1,500 per each piglet. The hogs add diversification to the income-generating activities of the project beneficiaries, broadening the base of their economic activities and reducing the risk of income shocks should something happen to their other productive activities.

Improved nutrition. A key to improving livestock performance is improved nutrition, and nutrition components were built into each livestock activity, including the UPANIC sub-grant. Pasture introduction benefited 266 households with 224.5 manzanas planted of Angleton grass and Gamba grass. An additional 72.5 manzanas of forage sorghum were planted by Santa Ana to be harvested with the project-donated forage cutter and harvester implements. Twenty-eight *hornos forrajeros* (storage silos) were built throughout the region to provide producers with infrastructure to house their silage and hay for dry season feeding. Converter, a dry season

protein supplement, was also introduced on a large scale and demonstrated the benefits of using a dedicated supplement to prevent weight loss during periods of low natural pasture/fodder supply.

Improved Marketing Infrastructure. The project also constructed a centrally located livestock holding and auction center to be used by area producers to house animals being bought in the area. This will facilitate marketing by providing scales for accurate weighing and a holding pen for animals as they wait shipment across the Honduras border or to other cities in Nicaragua.

The figures expressed in this section are current as of October 30, 2001. Since ARAP's conclusion, UPANIC has maintained operations in their six municipalities, providing technical assistance and services to the producers using its own finances and additional donor funds. In addition the Santa Ana cooperative has signed with USAID partner, Cooperative Resources International (CRI) of Wisconsin, a memorandum of understanding to continue working in their three municipalities. The UPANIC/Santa Ana livestock program has shown it can successfully operate both with ARAP assistance as well as secure additional support for post-ARAP operations.

APEGARO

Based in the remote town of Rosita, in the North Atlantic Autonomous Region (located at the half way point on the only road linking northeastern Nicaragua with the rest of the nation), the Association of Livestock Producers of Rosita quickly developed into a key player in the area's agricultural economy. This activity was first validated by ARAP consultant Ron Randel, who visited the region and assessed its suitability for environmentally sustainable livestock production and who made recommendations on improved pastures to improve productivity. Additional technical assistance was provided throughout the life of this project by sub-grant financed technicians in artificial insemination and veterinary health.

APEGARO livestock holding and weighing facility, Rosita. This integrated facility, the only one in the Atlantic Coast region, includes a highly accurate livestock scale, allowing local producers for the first time ever to get accurate weight information, a critical factor as livestock are bought and sold on a live-weight basis.

Under this activity, 150 households in 12 local communities were provided marketing and technical assistance. Probably the most successful of the ARAP-supported livestock projects due to the interest and dynamic character of the producers, this project left 110 cows inseminated, with first calving programmed for the end of 2001, and introduced 110 improved hogs, of which first litters are being returned as in-kind payment to the association and redistributed to new members. As part of its animal nutrition program, the association seeded 141 manzanas of new pasture area (176 percent higher then the 80 manzanas originally programmed) established 42 parcels of International Potato Center-approved sweet potato varieties totaling 15.25 manzanas (153

percent more than programmed) and emphasized the production of mineral and salt block to its members. This last point, by itself, is estimated to reduce the period of time between estrus from 12 months to 3-4 months, increasing rates of pregnancy.

The association also emphasized sales and marketing events. The Rosita Farmers Fair and Auction (only the second ever to take place in the RAAN), managed by APEGARO with ARAP support, generated approximately C$126,000 (U$9,500) in sales and was also used to inaugurate the APEGARO offices and to present new technologies to the community (artificial insemination, electro-ejaculation, new pastures and sweet potatoes) for their future use. Events such as these are crucial for the surrounding communities to be aware of the technologies and marketing opportunities available to them. This first-of-its-kind event for Rosita was a major success, and will continue even after ARAP.

A final success for this association was the establishment of infrastructure needed to house the Association's activities, a key to post-ARAP sustainability. This integrated facility contains an office, a livestock marketing corral including a cattle weigh-scale and space enough to house 60 head of cattle. Built by the efforts of the association with only design support provided by ARAP, it also includes an area for butchering and selling meat and the only veterinary pharmacy in the town, which at project closure had sales of C$86,000 (U$6,500) and had in stock C$94,500 (U$7,100) in medicine and other equipment. Now firmly on the path to sustainability the association has made three additional trips to Managua to acquire medicine for the pharmacy. Sales of services and hogs had reached C$64,000 (U$4,800) and dairy products C$705,000 (U$53,000) by the end of ARAP reporting.

ARAP support to CONOR 380 included agricultural equipment to assist the cooperative in providing fee-based services such as tillage, plowing and planting to cooperative members.

CONOR 380

Though CONOR 380 had as its primary focus basic agriculture production, it also contained a significant livestock component. Centered on the establishment of a functioning dairy farm/ training school and the distribution of improved breeds of hogs, sheep and chicken to area beneficiaries, CONOR's purpose was to provide increased income by improving productivity of the herd via genetic improvement and improved feeding practices and rations. The livestock component benefited 919 households in 73 communities throughout the department of Nueva Segovia. Sales during the project were C$416,050 (U$31,000) and comprised in-kind payments to the cooperative of new stock born. It is estimated that 6,700 animals will be redistributed from first births to other members of the community, and CONOR 380 is also exploring the establishment of a chicken and egg production business to supply fresh eggs and meat to Quilalí and the surrounding areas.

Additional ARAP-supported investments with CONOR 380 included the development and installation of irrigation systems, a 50,000 gallon water tank, 7 manzanas of newly established pasture and a forage chopper, and a 150-head capacity refurbished corral. Technical guides for the production of sheep, hogs and chickens were developed and printed for CONOR 380, and the cooperative's personnel attended an ARAP-sponsored course on advanced artificial insemination techniques given by the Nicaraguan Ranchers Federation (FAGANIC).

CONOR 380 also benefited from significant technical assistance provided directly or indirectly via ARAP. Both Martin Lacayo and Agusto Oporta (ARAP-hired local livestock consultants) dedicated over 50 percent of their time to working with CONOR on livestock procurement, herd management and administration, facility construction and forage production. Without this frequent, timely assistance, many of CONOR's questions would not have been answered and the productivity of their livestock activity would have been reduced.

D2. Dairy

The market justification for dairy is similar to that of livestock. Nicaragua has a strong tradition of dairy production, with official statistics showing it to be a net exporter on a regional level. Unofficial sources put the actual level of exports at a higher level, reflecting even more strongly Nicaragua's competitive advantage in dairy and cheese production. ARAP, however, approached the market issue for dairy, especially cheese, from a slightly different perspective. The project recognized early on that the main issue for maintaining or expanding markets for Nicaraguan product was to increase the quality and cleanliness at all levels of the operation. The payoff for this would be formal certifications, issued by importing country governments that the plant in question met required hygiene and sanitation levels and was thus eligible to sell directly to that country. This would in turn allow buyers to formalize purchases, report sales amounts and indicate origin and destination of the product. Prior to this, product that was not certified could not legally enter into the destination country, leading to smuggling and a lack of chain of custody for identifying contaminated or sub-standard product. By formalizing the marketing relationships consumers were able to identify the source and origin of Nicaraguan cheese, and were provided the assurance that the plants met certain minimum standards as set by their respective governments.

Hygienic conditions in dairy processing were a focus of ARAP. Support included technical assistance and publication of Nicaragua's first dedicated Best Manufacturing Practices manual for the dairy industry.

ARAP would measure its success in terms of market strengthening and the amount of jobs it helped secure by **formalizing and stabilizing market linkages**. It also collected and reported on formalized export sales, which in many cases jumped from zero reported to several hundreds of thousands of dollars.

In this sector the provision of timely short-term technical assistance was the key to activity success. ARAP provided a significant level of effort in the areas of plant certification (Raul Amador) and also provided assistance in market development (via sourcing visit of Luis Roberto Fernandez, a Salvadorean cheese buyer), environmental impact assessment for plant construction, and a design specialist for sanitary systems in a new plant. Without the efforts of these consultants the hoped-for results in the sector would have been difficult, if not impossible, to obtain. For example, until ARAP facilitated the services of a professional environmental impact specialist, the Ministry of Environment (MARENA) had refused to review the construction plans of the Santa Marta dairy plant. The ARAP-financed consultant was able to work with Santa Marta to meet MARENA reporting requirements and secure their approval for the construction, a necessary step in obtaining formal bank financing.

ARAP recorded C$33,700,000 (U$2,530,000) in sales from project-assisted plants up to October 30, 2001. Of this C$32,900,000 (U$2,470,000) are the sales of cheese from the dairy technical assistance program established by ARAP with the assistance of dairy consultant Raul Amador. The rest are sales from the APEGARO and CONOR 380 projects, which are primarily fluid milk and fresh cheese (*cuajada, queso crema, crema*). Households benefited by this project were 5,942 and included providers of raw milk to ARAP-assisted dairy plants. In addition 250 ***Best Manufacturing Practices*** manuals were designed, printed and distributed to dairy plant operators, USAID partners and projects such as PROVIA, producer federations such as CANISLAC, and relevant Government of Nicaragua ministries, providing an approved reference text for proper management of hygienic conditions in Nicaraguan cheese plants.

Construction begins on the new Lácteos Santa Marta plant in Jinotega. ARAP supported Santa Marta with marketing information, environmental impact assessments, and in preparing the feasibility studies required for Santa Marta to obtain $127,000 in bank financing for the plant. The plant was inaugurated in February 2002.

Dairy Certification and Marketing Program:

This program, based entirely on technical assistance and marketing trips may well be the sector with the best cost to benefit ratio of all ARAP activities. In 13 months the project was able to mobilize over $2 million in sales (dating from the first plant certification), covering the sale of 2,170,000 pounds of cheese from 8,680,000 liters of milk produced by approximately 5,800 small producers in the departments of Matagalpa, Jinotega and RAAN. The export of cheese (primarily Nicaraguan *morolique*) to Honduras and El Salvador, along with trial shipments to the United States, occurred because of the plant-level certification described earlier. During the life of the project five plants were certified by Honduran authorities for export to that country. Of these five, two plants were also certified by inspectors from El Salvador, with one of these plants meeting standards for export to the United States. All the plants are currently certified through May 2002, and have an economic and

commercial interest in maintaining their official certification with importing countries post-ARAP.

As noted in the market justification, ARAP recognized early on that the main issue for maintaining or expanding markets for Nicaraguan product was to increase the quality and cleanliness at all levels of the operation. Purchasing the equipment required to upgrade these operations in many cases was beyond the ability of the plant owners, often because the paperwork required to access formal financing was too complicated for the owners or there was simply a lack of information as to what sources of credit existed in Nicaragua. Based on the market justification that importing countries will require pasteurization, ARAP contracted the services of Celia Maria Morales to conduct a survey of available credit sources in Nicaragua for the acquisition of pasteurization equipment and plant/process re-engineering. Her findings were presented to actors in the dairy sector, particularly the owners/operators of dairy processing plants. This presentation led to the need for ARAP to assist plants in formulating feasibility studies to access available credit. As a result of ARAP's efforts, U$320,000 in credit has been financed by the private banking system to two plants; one located in Jinotega and the other in Leon. Both have broken ground on construction and will be fully operational in 2002, providing additional markets for area producers of raw milk and leading eventually to increased exports.

Delivery of raw milk, Jinotega. ARAP support to dairy plants helped guarantee the livelihood of over 5,000 families at all stages of the dairy value chain, from rancher to dairy plant worker.

Environmental Impact Assessments. To meet Nicaraguan government pollution standards and U.S. government sanitary standards, the project financed three studies for the management of residual water and effluents produced by the dairy plants. Project designs were presented to Nicaraguan Ministry of the Environment (MARENA) and were approved. Design of one additional plant was done so that the plant could comply with U.S. (FDA) requirements. This was accomplished by the contracting of timely technical assistance in both industrial design and environmental impact assessments. The latter was particularly useful, as MARENA has a specialized procedure for approving plans that requires consultants that are familiar with documents MARENA requires. While it is in reality a mechanism to ensure that only those consultants who are familiar to MARENA are used to carry out such studies, ARAP was still able to support the Santa Marta dairy plant in meeting these requirements and obtaining the approval of MARENA, a pre-condition for bank financing of their new dairy plant.

Market study trips. Two market study trips were taken by ARAP producers in an effort to reduce the intermediation required for product to move from plant to final consumer. These trips, one each to El Salvador and Honduras, were very successful. Lácteos Altamirano and Paso Real met with buyers in Honduras to whom they are now exporting. Lácteos Santa Marta made initial contacts with Pizza Hut Honduras to which they are now exporting parmesan and mozzarella

cheese. The technology to produce these cheeses and others such as provolone was introduced from Honduras where producers met Mr. Ettore Zanone, a master cheese maker. Mr. Zanone was later hired by Lácteos Santa Marta to provide cheese making courses to their staff. Other benefits of these trips included the presentation given by CRYOVAC (a food quality packaging company) whose products are now used by both Lácteos Santa Marta and El Bosque. Market study trips can have positive results if the individuals involved are dynamic and outward oriented. By ensuring that the people who went on such trips were both able and interested in deal making, ARAP greatly increased the likelihood of successful business contacts.

The final activity of this project was the elaboration and presentation of a Best Manufacturing Practices Manual for the dairy industry. Supervised and approved by the Nicaraguan Ministry of Agriculture (MAG-FOR), this manual was presented, in conjunction with the *Cámara Nicaragüense de Lácteos* to producers and other groups (including USAID partners) working in the dairy sector. It is the first such reference work to be published in Nicaragua and will provide plant operators with the necessary information to be able to bring their plants up to the specifications required for certification.

D3. High-Value Horticulture

Market justification: market demand was the driving force behind ARAP's horticulture projects whether for local market or export. Market opportunities were first detected and identified and then production technology brought in to provide increased productivity, quality and eventually income for Mitch-area vegetable producers. In the case of sweet onions, ARAP worked to reactivate an existing industry that had been devastated by Hurricane Mitch. In the case of high-value vegetables, supermarket demand provided the incentive for growers to adopt technologies to produce tomatoes and peppers on a continual basis. A potato chip factory in Chinandega negotiated purchases of all potential potato production from the Estelí department. **Clear market demand existed**. As a result of this demand, sales for the sector for 2000-2001 were estimated to be $1,230,000 and benefited 680 households. ARAP work in the sector focused on sweet onions with Agropecuaria El Cacao, counter-seasonal vegetables with a number of producer groups, and potatoes through ECAGE.

Technological solutions such as hoop tunnels allow counter-seasonal vegetable production. Here high-hoop tunnels are being constructed in Aponpoua, Matagalpa.

This activity is the direct result of a series of specialized technical assistance assignments. Laying the market justification was the comprehensive Central American Market Study prepared by Ricardo Santa Cruz and Associates, which was followed by an institutional demand study (primarily supermarkets) by ARAP consultant Carlos Azmitia. Both of these assignments provided ample proof to ARAP that there existed significant unmet marketing opportunities for

high-value horticulture on a local, regional and international level. In addition ARAP consultant David Yurosek identified niche market possibilities for organic produce exports to the United States, ARAP consultant Shirley Kline provided expertise in onion production (including organic production) and shipping; Dr. Mark Gaskell introduced improved hoop tunnel technology to Nicaragua; and Jesus Coto, besides providing recurrent field-level technical assistance on a variety of crops, introduced new technologies such as melon trellises and improved sweet corn production. High value horticulture is a sector which without the recurrent and timely provision of technical assistance services would have failed due to poor market, production and post-harvest knowledge.

AGROPCSA

Located in Chaguitillo, Sébaco Valley, Matagalpa this cooperative was the recipient during 2000 and 2001 of two small grants used to promote the production of sweet yellow onions to supply existing demand for this product in the U.S and the Central American region. Total acreage planted by the coop and other beneficiaries of the grant in the first year of operation was 50 manzanas. The project quickly grew to cover an additional cooperative and various private producers, increasing the total beneficiaries from 52 to 59. As a result of combining improved production techniques with a coordinated marketing campaign (including attendance at the 2000 Produce Marketing Association convention where onion producers met with a variety of importers and brokers), export sales worth U$951,000 were achieved for the 2000/2001 season via U.S. importer Keystone Marketing of Pennsylvania. During the January/March market window, 38 containers of onions were exported to the United States, 11 to Central America and seven were sold locally.

Selection of onions for export, AGROPCSA, Sébaco Valley. Using American-made sorting equipment these workers, primarily women, grade onions for either the domestic or export markets.

For the 2001-2002 season, ARAP diminished financing (in large part because of the financial success of the 2000-2001 season) but planted area has now increased to 70 manzanas. As a way of differentiating their product, approximately 20 manzanas of onions will be certified organic. The total number of producers has increased to 70 and now covers the geographic area from Sébaco all the way to Ciudad Dario. Production is based on continual demand being shown by U.S importers who are interested in supplying the commercial sweet onion window in the United States. Given similar market conditions as last year, the sales for this coming harvest are estimated to reach U$1.2 million. ARAP received an update in January 2002 that Keystone Marketing, the company which marketed most of Nicaragua's sweet onion crop last year, has signed a new contract to do so again this year with the growers in the Sébaco valley if the price point at harvest is similar to the level of 2001.

Technical assistance has been a key to the success of this project. In addition to marketing assistance, an important operational consideration for a perishable product such as onions is post-harvest handling. ARAP brought in Mrs. Shirley Kline to provide all Sébaco-area producers with production, harvesting and quality control assistance. In addition Mrs. Kline inspected product on arrival in New Jersey at the Keystone packing and grading facility. Her inspections, and the relaying of key, timely information on product quality dockside, greatly reduced handling and packaging errors for all shippers. She also provided production guides for organic sweet onions, the first time this type of information has been documented for Nicaragua.

On a more personal note, possibly the greatest benefit to the producers has been the ability to access credit from the banking system. For the Cooperativa Leonel Valdivia, the project meant they were able to become current on their loan obligations, avoiding an almost certain foreclosure on their land. This situation was repeated several times over the life of the project and provided ARAP staff with a great deal of professional satisfaction.

In a related activity (and with no direct cost to USAID) ARAP, in conjunction with local producers and international seed companies such as ASGROW, PETOSEED and SAKATA, established new hybrid onion variety trials in which 53 varieties were or are being tested for suitability to Nicaraguan conditions. This is important as current varieties are ending their useful life, and varieties specifically tested for Nicaragua will soon be needed in order for growers there to maintain their competitive status. With the conclusion of ARAP the seed companies are continuing to work directly with producer groups to finalize trials and disseminate results.

Protected Cropping and Counter-Seasonal Vegetable Production

Hoop tunnels allow tomatoes to be grown during rainy season, when much high-value fresh produce must be imported. These tomatoes will supply Managua supermarkets with fresh, high-quality local product while providing increased incomes to growers during the rainy season.

The High-End Institutional Market Study, carried out by ARAP consultant Carlos Azmitia, pinpointed existing demands (principally from supermarkets and wholesalers/distributors) for a variety of fresh produce not supplied by local producers. ARAP combined this market information with technological innovation (protected cropping technology or hoop tunnels introduced by ARAP consultant Dr. Mark Gaskell), and in conjunction with 6 local producer groups, installed 52 hoop tunnels for year-round fresh vegetable production. The project initially installed 29 tunnels in La China and Apompua (Matagalpa) and Coop. Santa Rosa (Madriz) which benefited 57 households. Due to great interest on the part of other producer groups, ARAP then expanded the scheme with an

additional small grant to AMDES, based in Nueva Segovia. This group installed an additional 23 tunnels in El Zapote and Ciudad Antigua, bringing the total number of beneficiary producer families for this activity to 75.

A key to the success of this type of activity is timely and recurrent technical assistance. New technologies bring with them questions that producers have not had to face, and local expertise may not be able to provide a timely solution or answer. To ensure that ARAP beneficiaries received recurrent, timely technical assistance Honduran consultant Jesus Coto was contracted by ARAP to provide assistance in all aspects of the high-value horticulture sector. In addition to frequent visits to all producer groups Mr. Coto was instrumental in assisting ARAP in the introduction of trellised melon techniques, cucumber production and the introduction of an improved sweet corn variety (FHIA Don Julio) for local market. Mr. Coto also assisted ARAP, Sakata Seed and producers working on seed trials for 24 different vegetable hybrids in 3 areas of the country.

Intensive systems such as tunnel production centered on salad tomatoes and bell peppers can have great impacts on the levels of productivity. Using the ARAP-designed system producers in La China achieved yields of 180/50 lb boxes of tomatoes with a sales value of over $2,100, which would represent potential production of over 3,100 boxes per manzana or 72 tons and sales worth over $41,000/manzana. Sales for other products also demonstrated increased opportunities for diversification for the producers. Sweet corn, squash, peppers and Chinese greens and vegetables provided good sales opportunities for small producers, with sales reaching $5,800 during ARAP involvement.

This technology frees producers from reliance on a specific growing season for their products. Normally during the rainy season open-field tomatoes and peppers are not grown due to fungal problems, virus pressure, waterlogged soils and so forth. This technology allows counter-seasonal production, where producers can supply local markets with high-quality, reasonably priced produce on a constant basis ending reliance on expensive, travel-damaged imported goods from throughout the region. Steady production also means steady income for these producers, who can plan on a continuous cycle. Finally, the technology is both simple and replicable. ARAP provided assistance to several USAID partners, including Catholic Relief Services, in the design of similar structures for their growers. AGROPCSA has provided the Nicaraguan Rural Credit Fund with complete plans and an assembled model structure so that this fund may develop financing alternatives for its propagation nationwide. It is hoped that this innovation will be a lasting contribution on the part of ARAP to Nicaraguan agriculture.

ECAGE Potato Marketing and Production Program

Market justification: In the past Nicaragua was a small but not insignificant producer of potatoes for domestic consumption, both household and industrial. During the 1980s Nicaragua was unable to access improved seed, and productivity fell dramatically. When ARAP initiated work, local demand was met primarily by frozen product from Guatemala, a low-quality potato sold at a high price. Local supermarkets indicated that they could purchase significant amounts of local production, and local industry indicated the same. ARAP entered into an agreement with the

Catholic School of Agriculture and Livestock in Estelí (ECAGE) to promote the introduction of improved potato varieties and cultivation practices.

The project has been very successful. ARAP-supported production will lead to sales of C$8,350,000 (U$627,000) for one complete 12-month production cycle. Of this amount C$3,230,000 (U$242,000) has already been sold, with the largest harvest cycle yet to come. A total of 108.4 manzanas have been planted during the past three seasons with the last 50 manzanas being financed directly and totally by ECAGE, including seed bought with the proceeds of a revolving fund set up by the project. From an original goal of 67 producers the project has expanded to include more then 240 beneficiary families in the relatively short life of the activity.

As is standard with all ARAP activities, marketing assistance was provided to ECAGE and project beneficiaries. In addition to selling in the open market, several producers have signed marketing contracts with Agro-Pacifico S.A , a Chinandega-based chip plant, which will be paying a fixed price of C$175 (U$13.15) per qq/farm gate. Local buyers, wholesalers and distributors were also taken to meet with producers in the area and contracts with local supermarkets signed. Del Sol Marketing, a local distributor, has also bought potatoes from the project to sell to its consumers in Managua.

Lack of access to improved seed in the 1980s decimated Nicaragua's potato industry. Under a sub-grant from ARAP the Catholic Livestock and Agriculture School in Estelí reintroduced commercial scale production with small growers of improved varieties of both white and red potatoes. For the first time in over 10 years, Nicaraguans are now able to purchase domestically grown red potatoes in their supermarkets (photo: La Fe Supermarket, Managua).

To improve production and incomes for the producers, ARAP and ECAGE personnel provided a variety of technical assistance in production and post harvest handling. On a final note, due to the efforts of ARAP and ECAGE to secure the best possible genetic material, three previously unknown varieties of potato were introduced to Nicaragua and planted commercially, laying the foundation for continued growth in the industry as producers select and plant the seed that most suits their needs. Yields of up to 400 qq per manzana are being reached with this new seed, significant improvements over previous harvests.

As with the sweet onion success stories, the potato project made a significant personal contribution to a number of families working with ARAP. The project received a letter from six families indicating that the profits from their potato operations had allowed them to become current on their debts and avoid foreclosure on their land. ARAP has been told that this has been a very common outcome of this work, and is satisfied that it has assisted people in maintaining their livelihoods.

ARAP also worked with the Asociación Misión San Pablo de Tarso project in Bonanza, RAAN. Though this project closed early, it is estimated that during its brief life it sold an estimated C$30,000 (U$2,200) in vegetables to local communities.

D4. Tropical Fruit

Tropical fruits enjoy strong market acceptance both in producing countries and where admissible in export markets. The tropical fruit sector, in particular the sub-sector of exotic tropical fruits, was approached from two angles. First, ARAP focused on creating a new resource base of tropical fruits with excellent market opportunities and historically good prices. These fruits are either not currently produced in Nicaragua or are only produced on a small scale. Secondly, ARAP worked to create the technology to add value to already existing fruits such as pitahaya by identifying systems to add value to the final product, for example by de-seeding or identification and separation of specialized chemical compounds unique to that product.

Consultant assistance played a major role in the sector. Initially, ARAP consultant José Mondoñedo provided the project with market information and a technical review which showed sufficient justification for the PAC Exotic Tropical Fruit project to be developed. Luis Cisneros of our RAISE consortium member Texas A&M showed local fruit processing companies the necessary technology to upgrade their processing facilities for deseeding pitahaya (a market requirement for the juice pulp industry). And Christopher Menzel from Australia inspected and validated the production sites and varieties of lychee and longan introduced by PAC. Each of these consultants played a key role in an activity undertaken in this sector. Without their assistance, the work in the sector would have been much reduced in scale and impact.

PAC Tropical Fruit Project nursery. These structures allow the grow-out of high-value seedlings in support of the ARAP-financed tropical fruit project.

ARAP work in the sector was principally through a large sub-grant agreement with the group *Pueblos en Accion Comunitaria,* a Nicaraguan NGO that was supported by the U.S.-based PVO World Relief. The program involved the introduction of commercial quantities of planting material, the construction of three reception and propagation centers for the material, and the training of producers on planting and management of this material. The four most significant introductions were mangosteen, lychee, longan, and rambutan, with an additional 30 varieties of plants and spices introduced for a total of more then 144,000 plants produced and ready for planting or planted by beneficiaries. Over 1,200 households were benefited by this project, which were located in three main areas: 1) Las Sabanas (Madriz); 2) Wiwilí (Jinotega) and San José de Bocay (Jinotega).

Major accomplishments of the ARAP/PAC collaboration include:

- Nursery introduction of 500 lychee trees, 1,115 rambutan trees and 500 longan trees, the largest such introductions ever for Nicaragua
- Nursery introduction of 747 mangosteen trees from RAAS, creating the base for the largest new plantings of mangosteen since World War II
- Introduction of 1,036 black pulasan trees, 45 durian trees, and 13,129 FHIA variety plantains to provide income generating opportunities for small farmers
- Field planting of first 280 mangosteen plants in San Jose de Bocay
- Field planting of 5,796 FHIA plantains in Wiwilí and San José de Bocay
- Field planting of 1,988 rambutans in Wiwilí and San José de Bocay (Nueva Guinea seed stock)
- Field planting of 15,402 cinnamon, 238,830 black pepper, 472 mango trees and 800 avocado trees in Wiwilí and San José de Bocay

PAC and Sustainability

PAC has taken several significant steps fortify and sustain the project post-ARAP. These include construction of three greenhouses covering 1,800 square meters in northern-central Nicaragua, serving some of the areas hardest hit by Hurricane Mitch. PAC also carried out technical training of 134 producers and technical staff and sponsored visits by technical staff and producers to Guatemala to learn fruit production techniques. PAC has also authored a Strawberry Production Manual for reference, the first for this fruit in Nicaragua.

It is estimated that the number of beneficiary households for the tropical fruit activity in Nueva Segovia, Madriz and Jinotega will number 1,296.

Finally, by teaming with both a Nicaraguan NGO and a U.S.-based PVO, ARAP has guaranteed that the unique requirements of this project (principally continued supervision over the long lead time for production) will be covered after project closure. This model is something that USAID should review and examine as a way of leveraging limited-duration contracts through cooperation with cooperative agreement PVOs.

Working with the National Agrarian University (UNA) ARAP provided support, including laboratory equipment, to assist in fruit fly infestation trials involving Nicaraguan pitahaya, a brilliantly colored cactus fruit. These trials are an important step in determining if pitahaya can be safely exported in fresh form to the United States.

ARAP also worked on two specialized sub-projects for pitahaya, a cactus fruit which possesses a unique color and texture. The first of these specialized activities involves the chemical analysis of a series of natural colorants. The study, carried out by RAISE subcontractor Texas A&M University, has identified a series of potential uses that would be of interest to the food industry in the United States. The study is being distributed and the findings will be published in peer-reviewed industry journals, ensuring maximum dissemination of the results. A unique feature of this study is that Texas A&M and ARAP secured outside financing for part of the work. A $5,000 donation by the U.S. firm Artemis International combined with $2,000 from

APENN of Nicaragua covered approximately 30 percent of the total cost of the study. This partnership between private producer associations, industry and ARAP has allowed an important study to be carried out by leveraging a variety of resources and reducing the total cost to ARAP.

Finally, ARAP worked to lay the foundations for increased exports of fresh fruits from Nicaragua by designing a USDA-approved protocol for determining the host status of pitahaya for fruit flies and other potentially damaging pests. During the life of ARAP, the project worked with the National Agrarian University (UNA) to upgrade their laboratory facilities and capabilities and train them to carry out the necessary trials. It also worked through the Honduran Agricultural Research Foundation (FHIA) to design a scientific protocol acceptable to USDA. At the end of ARAP, the Government of Nicaragua was in discussion with USDA's Animal Plant Health Inspection Service (APHIS) on carrying out the approved research program laid out in the protocol. This is important, as the Government of Nicaragua now has an off-the-shelf product it can fund to assist in the potential future expansion of export markets for fresh pitahaya.

D5. Ornamental Horticulture

Market justification. Production of ornamental plants for local sales and export is an area in which Nicaragua – which has inexpensive land and labor, quality water supplies, and competitive airfreight rates to major markets such as Miami – can compete with other countries in the Central America region. Access to Europe and the United States by container or to Europe by plane was determined not to be cost effective at this moment, so ARAP efforts focused primarily on the high-value market in the United States and on development of the national (domestic) industry and market.

Picture from the first-ever Expo Venta of ornamental horticulture products in Nicaragua. Held at Metro Center mall in Managua, the show introduced Nicaraguan floral producers to the possibilities of coordinated marketing and public shows.

Ornamental horticulture production for export can only be called a growth industry for Nicaragua, as current production is fragmented, with producers lacking market and technical information, organization and political clout. Recognizing this, ARAP worked on establishing an association to bring together disperse groups of producers into a functional association that could work toward modernizing the industry. By formalizing an association they could obtain several benefits: 1) better understanding of possibilities in the world market; 2) receive technical support on determining geographical areas and climate, finance and infrastructure needs to produce export quality material; and 3) receive recurrent technical assistance in all facets of the industry including business management and planning assistance.

As a result of this effort UNIFLORA, the national ornamental and cut flower producer association, was established by interested producers with ARAP assistance. The association,

which has already requested legal status certification by the Nicaraguan National Assembly, has associated itself with APENN and is now working to promote the industry on a nationwide level. The president of UNIFLORA now sits on the Board of Directors of APENN and is working to increase the influence of UNIFLORA in the national non-traditional export arena.

UNIFLORA has been an important catalyst for change. With the assistance of ARAP, it established the first National Flower Show ever in Nicaragua. This groundbreaking three-day event, held at Managua's premiere shopping center, brought individual producers and three cooperatives C$225,000 (U$17,000) in show-floor sales and an additional C$615,000 (U$46,000) in contracts. So successful was the first show that UNIFLORA staged three additional events during 2001, netting additional sales for members of approximately C$1.0 million (U$75,000). ARAP, through UNIFLORA, created a significant force for change that will continue long after the project closes.

UNIFLORA members received recurrent technical assistance in ornamental plant production from ARAP consultants Jílma Ramírez, Cornelius Janson, Garret den Bleyker and Paul Daum. Participation in trips to Costa Rica to visit the Ball Seed Nurseries and marketers of garden and gardening accessories were also of great benefit to the members. As a result of these trips, members introduced numerous new plants and production inputs into the local market. In addition, members of UNIFLORA, accompanied by ARAP consultant Garret den Bleyker, were taken to Tampa, Florida to visit the Tropical Plant Industry Exhibition (TPIE), one of the world's premiere plant shows. Based on the knowledge and ideas acquired at TPIE, the project financed a number of consultancies to study both Europe and the United States and both cut flowers and ornamental plants. The study suggests that great possibilities exist in the production of palms, production of bulbs and some ornamental plants that could be niche marketed mostly in Europe.

COMJIMILF

COMJIMILF grow-out facility, Jinotega. With sub-grant support and technical assistance from ARAP, this group of women entrepreneurs is expanding sales and membership in their business cooperative.

The Cooperativa de Mujeres Jinoteganas Productores de Flores was another beneficiary of ARAP assistance. This group, composed of 27 women whose original business was heavily damaged by Hurricane Mitch, received two small grants from ARAP to establish production areas and import plant material for grow-out and local sales. Members also established additional sales points with ARAP financing on the Jinotega–Matagalpa highway and in the city of Matagalpa. Also with ARAP assistance COMJIMILF established two fully functional shade houses with overhead irrigation systems in the Jinotega area. These are being used to grow-out and produce mother plants of 37

different varieties that were introduced by the coop for local sales. This material was identified and procured during the ARAP-financed sourcing trip to Costa Rica. Finally the coop has participated in all the UNIFLORA sales events and another three regional fairs in which they financed their participation from proceeds of ARAP-supported sales. Sales to October 1, 2001 (end of ARAP reporting) from local fair sales amounted to C$85,000 (U$6,400) with monthly sales of C$5,000 (U$375) at their sales points.

This sector was not as successful as anticipated. Nicaragua still suffers from a series of structural problems that financing for most non-traditional activities. In addition, most activities for export ornamental horticulture require significant up-front investments, which put them beyond the reach of small and medium producers. Attempts to interest larger producers failed as the risks associated with the agriculture sector were deemed too high and the credit process too onerous. A lesson learned from this was that Nicaragua is just not ready for significant investments in this sector.

D6. Cash Crops

An extremely diverse sector, cash crops provided ARAP with a wide variety of potential products for interventions (coffee, cacao, cardamom, basic grains) marketing and technical approaches (organic certification, conventional production, specialty niches for coffee) and a broad geographic area (from Jinotega to the RAAN, sometimes 12 hours in vehicle from Managua and seven upriver by boat). ARAP work in this sector demonstrated the capacity of the project to work in the furthest reaches of the country and maximize each beneficiary group's marketing and production potential, with projects directed to meet the needs and interest of the beneficiaries. As in the other sectors, the provision of timely technical assistance on marketing, production and quality standards was crucial to the success of activities.

ARAP beneficiaries in La Cruz de Río Grande (Maranatha Cacao project) maintain cacao nurseries. This project reached 446 families with improved seed, technical assistance and marketing support, despite being the most remote project in the ARAP portfolio.

Cacao

Market justification. Cacao is a traditional cash crop well suited to small holders. Though a commodity with fluctuating prices based on world supplies, it has traditionally provided income security to large amounts of small land holders and improvements in yield and quality are obtainable with relatively small efforts. ARAP worked with two types of cacao projects. The first, centered in La Cruz de Río Grande, focused on conventional, high-quality cacao while the second, in Waslala, focused on organic cacao.

Working with the Iglesia Maranatha's La Cruz de Río Grande Cacao Project, ARAP approached the sector with the goal of increasing the quality and quantity of conventional production by: 1) introducing 500,000 hybrid cacao seeds to establish new cacao plantations; 2) establishing drying, fermentation and marketing centers for cacao and other local products; and 3) management and control of *monilia*, an endemic fungal disease which lowers quality and output, on 300 manzanas of existing production in the project area.

The project is located on both banks of the Río Grande de Matagalpa river, which in some areas serves as the boundary between the RAAN and the RAAS. Based in the town of La Cruz, 189 kilometers to the northwest of Bluefields, the project covered 20 communities (40 percent more then originally projected) both upriver and downriver.

Originally intended to introduce 500,000 seeds, the project was only able to deliver 477,000. This was due to the inability of the Centro Experimental El Recreo (the only provider of cacao seeds in Nicaragua), to provide the total amount. However, due to greater-than-envisioned community interest, excellent management and the technical assistance provided by ARAP consultant Jesus Sanchez, who visited the region on three occasions and provided an additional seminar on management post harvest and marketing, a total of 446 households benefited from the project, planting 487 manzanas of revitalized plantations. Existing production areas were managed for monilia control and subjected to improved fertilization techniques. To improve the quality of the harvested cacao, the project financed the construction of 10 fermentation boxes, 4 solar driers and 2 marketing centers. These improvements in technology and post harvest handling are expected to bring area producers approximately C$1,450,000 (U$109,000) in sales over the marketing season October 2001–April 2002.

Pro-Mundo Humano, Organic Cacao Project

Value added through organic certification to obtain superior market prices was the first of two major goals of this project; the second being to provide local area producers with the tools needed to produce an export market quality product. These goals were surpassed by the project, whose legacy includes:

1) 385 producers in 24 communities of the Waslala area trained in organic production and post harvest of cacao, 92 percent more producers then originally estimated.
2) 270 producers certified fully organic by Bio Latina and 115 producers certified transitional organic.
3) Acceptance of the producers into the Fair Trade regime, whose certification

CACAONICA members disseminate market and technical information via radio to cooperative members in Waslala. ARAP support in marketing and technical assistance allowed CACAONICA to export, in February 2002, $40,000 of high-quality organic cacao to Europe.

will allow them to receive up to U$1,750.00/ton/FOB Nicaragua vs. $900/ton conventional.

4) Sales of 4 containers of cacao to Honduras and Café Soluble in Nicaragua, valued at $86,000.
5) Signed contract with German chocolate company Ritter for 5 containers of Fair Trade Organic Cacao, worth $175,000 dollars.

The provision of technical assistance was also critical to the success of this activity. ARAP cacao consultant Jesus Sanchez provided post-harvest and plantation management assistance to the Pro Mundo Humano-supported producer groups, and ARAP field promoters actively assisted the groups in establishing marketing contacts. One of the keys to the success of this activity was the ability of the local producers to organize themselves and cooperate to secure organic certification and high-quality cacao. Without the desire of the producer groups to help themselves, this activity would not have been successful.

Cooperativa Río Grande Productores de Cardamomo Orgánico

The market justification for this activity was based on initial contacts with this cooperative set up between ARAP consultant Janja Eke and Peter Lendi, the owner of the Swiss spice and medicinal plant company *Eboristi Lendi*. This company has now offered to buy all existing cardamom production as long as it meets quality and organic standards. To facilitate the sale, ARAP entered into a sub-grant to provide technical assistance on organic certification and production techniques for the 37 members of this coop. As a result of this assistance, the cooperative has signed a marketing contract with Eboristi Lendi, which based on the existing 18 manzanas and production of 20/hwt/manzana, will provide area producers a total income of U$130,000 in their first year of production. Once an additional 10 manzanas planted are certified and production meets quality standards, sales should increase to $183,000 annually. As a backup market for substandard product, the cooperative has identified a Honduran candy maker that will take product, though for much less than the foreign buyer. To ensure that the maximum amount of product meets quality standards and thus has access to the best markets, the project facilitated the construction of a drying and quality control center for the housing of cooperative-financed drying equipment.

The Jinotega-based Cooperative of Organic Cardamom Producers received support from ARAP to upgrade their processing facilities to meet European export market requirements. This photograph shows the inauguration of their new drying facility.

Technical assistance in marketing was vital for this activity. Initially, ARAP provided technical assistance via a market study of European buyers of spices and medicinal plants. This study led to ARAP-facilitated contacts between the Swiss buyer, Peter Lendi, and different producer groups. Mr. Lendi has now provided a firm buy offer if quality and organic certification can be

obtained. **Without the market study and market contacts promoted by ARAP, this activity would not have taken place**.

Basic Grains

CONOR 380

The Cooperativa Multisectorial del Norte Conor 380 (CONOR 380) signed a large grant agreement with ARAP covering two basic programs: livestock improvement and agriculture. The livestock component has already been discussed. Under agriculture, the main part of the grant covered grain crop marketing and production and coffee production and management.

Under this sub-grant, 847 households in 73 communities spread over three departments of northern Nicaragua benefited from ARAP assistance in the production and marketing of over C$5,600,000 (U$420,000) worth of coffee, rice, beans and corn. Highlights included:

- *Technical assistance on coffee management and production.* The 616 manzanas of coffee under production in the area of Quilalí produced 4,620/hwt during 2000 and 2,464/hwt for 2001.
- *Planting and marketing of 248 manzanas of beans*. Representing an increase of 310 percent over original plantings, this led to sales of 4,148/hwt of beans at an average price of C$250/hwt for total sales of C$1,037,000 (U$78,000).
- *Planting and marketing of 274 manzanas of corn*. The resulting harvest of 13,700/hwt of corn generated sales worth C$1,233,000 (U$92,000).
- *Planting and marketing of 66 manzanas of rice.* Producing an income of C$391,000, production of this last crop was severely affected by drought, resulting in yields that were only 30 percent to 50 percent of expected.
- *Significant investment in agricultural equipment,* including a new John Deere tractor with a full set of agricultural implements and a compact rice mill for value added processing. By the end of the project the tractor had been used to prepare 258 manzanas of land in the area.
- *Creation of approximately 78,000 person days of work in the region* through ARAP-supported programs.

Though outside technical assistance was not contracted to work with the basic grain component of CONOR 380, ARAP did provide extensive technical assistance in accounting and financial management to ensure that the cooperative was able to account for monies and inputs received, and ensure accountability of U.S. government resources.

As a follow-on to this activity, ARAP has learned that under the auspices of CLUSA (a USAID partner PVO), CONOR 380 has successfully marketed 8,000 bags of ARAP-supervised and supported coffee, contributing to the sustainability of the activity post-ARAP.

Asociación Misión San Pablo de Tarso

During the short life of the project (located in nine communities around the town of Bonanza in the RAAN), 173 beneficiaries planted and marketed 200 manzanas of beans. Yielding 2,786/hwt this resulted in sales worth C$700,000 (U$52,500). Also planted and marketed were 250 manzanas of corn, yielding 2,597hwt, with a value of C$240,000 (U$18,000) over two cropping cycles.

Of particular concern in this region were extensive post-harvest losses of product due to the distance involved in reaching the communities and the lack of adequate storage facilities. In response to this, ARAP initiated the production and distribution of light-weight, portable, low maintenance grain silos, with each beneficiary household receiving two silos. The project distributed a total of 346 silos with 400- and 800-pound capacities, the first significant introduction of this technology in that part of the RAAN.

The sub-grant was terminated early following an investigation by ARAP staff that disclosed serious deficiencies in the administration and management by San Pablo staff of the sub-grant and USAID resources. These deficiencies were confirmed in a subsequent field audit by USAID/Nicaragua professional staff.

Decorative Accessories

At the mid-point of ARAP, the project proposed to USAID an innovative approach to rural employment and income generation centered on the decorative accessories industry and its potential to generate export revenues in a relatively short period. ARAP and APENN (with the support of CARE) entered into a sub-grant agreement to work with groups of families resettled in the aftermath of Hurricane Mitch. Despite significant effort put into the activity, the 12-month time frame in which the project operated was insufficient to move from product development/design to production of samples to market development, quantity production and export sales. However, the activity has not been without benefit. Groups, primarily composed of women, have been trained in home-made paper production and marketing techniques, oriented toward the domestic market. In addition, the IDB has hired local consultants to continue to work with the industry. Initial marketing contacts established under ARAP and formalized at the High Point International Home Furnishings Show will continue under the direction of this multilateral donor.

D7. Tilapia

Tilapia is a product considered for extensive development for some time in Nicaragua. Due to time and resource constraints, this activity (which was only first considered in the CY2001 ARAP work plan) did not contemplate assignation of grant resources to improve production, but instead focused on providing market information and business planning resources so that interested producer groups could make informed decisions on the product and seek additional resources. To support this, ARAP hired the services of Dr. David Hughes of Ave Maria University to provide business modeling for Nicaraguan tilapia projects. Using user-friendly models, Dr. Hughes presented three different seminars on tilapia in Mitch-affected areas,

describing a variety of profit scenarios and assumptions. Using this information, interested producers will be able to solicit support from groups such as APENN to further the state of the industry in Nicaragua. In addition interested producers were taken by ARAP to attend the Central American Aquaculture Symposium in Honduras, exposing them to major players in the Central American industry and providing them with market contacts and potential business partners.

D8. Institutional Development

Due to the short life span of ARAP, it was necessary to strengthen partner institutions so that they could either continue on without further assistance or at least have the tools to seek further donor or similar support. However, in two cases, ARAP found it necessary to foment the creation of new associations representing new crops/marketing groups to carry on the initial project work in representation of their beneficiaries, accessing additional technical assistance and continued marketing assistance.

The *Asociación Nicaragüense de Marañon, ANIMAR* (Nicaraguan Cashew Growers Association) is headquartered in Chinandega and encompasses producers in both the Chinandega and León departments. This group was created to pursue the production of cashew as a viable alternative for the coastal plains of western Nicaragua. The association, with an initial membership of 20, has now planted a total of 41.1 manzanas of cashew from 100 improved family lines. These will be used to provide improved varieties for the expansion of planting areas and as seed stock for commercial plantations. Using an initial 75 kg of improved, imported seed from Australia, 16 persons established small plantations during the rainy season of 2001.

Based on producer demand an additional 100 kg of seed were introduced into the country at the end of 2001, which will be planted in May-June of 2002. This will allow an increase in area to 120 manzanas of established plantations. Most of the seeds will be going to existing members but new interested producers have already requested seed and will be provided appropriate amounts. ANIMAR will use proceeds of seedling production and sales from the first year and future seedling sales corresponding to the second year plantings to contract technical assistance for members; it is expected that in 2002, ANIMAR will finance a technical assistance trip by Australian cashew expert Ian Duncan.

Technical assistance was absolutely necessary for this activity. The required expertise in cashew does not exist in Nicaragua, or on a Central American level. ARAP contracted the services of Ian Duncan, Australian cashew expert. Mr. Duncan provided marketing, nursery management, plantation management and other assistance to ANIMAR members. He was also the key contact for procuring additional high-quality seed for Nicaraguan growers. As one of his deliverables, he produced a guide to growing cashews under conditions prevalent in Nicaragua. This is the first time such a guide has been available in country and will be the standard reference work for many years to come.

The *Unión Nacional de Floricultores UNIFLORA* (National Union of Flower Producers) was organized by ARAP as a means to be able to focus the marketing and technical assistance requirements of the ornamental horticulture industry. Working with a wide variety of producers (from retailers to growers to exporters) ARAP worked with UNIFLORA to designate them as the

"go-to" group for information and marketing events for the sector. As part of this strategy, ARAP supported four UNIFLORA-organized sales (sales of approximately $75,000) and assisted UNIFLORA in developing their legal statutes and becoming members of APENN. ARAP also channeled technical assistance visits by Jílma Ramírez (ornamental plant production), Paul Daum (cut flowers), and Garrett den Bleyker (business planning) through UNIFLORA to strengthen the image of the association in the minds of its members. UNIFLORA was also the official channel for setting up visits to Costa Rica to view Ball/Pan-American Seed production areas and the Tropical Plant Industry Exhibit in Florida. UNIFLORA continues today in its mission to support the industry and is working both through APENN and independently to secure additional support for technical assistance and marketing information.

9. Sub-regional Focus: The Atlantic Coast

Logistical considerations provide challenge to distribution of disease-resistant coconuts to Miskitu communities on the Atlantic Coast.

The ARAP project's area of influence was limited to the Mitch-affected areas as designated by mutual agreement with the Government of Nicaragua and USAID. This area included seven departments in the Northern Pacific and North Central area of the country and the RAAN. The RAAN comprises 20 percent of the area of Nicaragua, but contains less then 10 percent of the total population. This is a land mass with an immense potential for development, though it has historically suffered from neglect and is essentially unattended by the central government. Until ARAP began operations in the region, it had not been included in the portfolio of USAID partners outside of the health sector.

Responding to the vacuum of assistance for the agriculture sector in the RAAN, the project undertook four activities in the region: 1) Iglesia Maranatha Cacao Project, located in 20 communities on the Río Grande de Matagalpa area (described in the Cash Crops section); 2) APEGARO Livestock Project located in 12 communities around Rosita in the mining triangle (described in the Livestock section); 3) AMSPT, Horticulture and Grain production project, located in nine communities around the town of Bonanza (described in High-Value Horticulture section); and 4) lethal yellowing disease of coconuts (LYD) project managed by FADCANIC in 40 communities in the area of Puerto Cabezas and the Río Coco watershed.

ARAP was essentially the only USAID partner working continuously on marketing and production in the region. The ARAP professional staff endured isolated conditions, long travel times and a difficult working environment that had deterred other partners from working in the region. ARAP became USAID/Nicaragua's key partner for the Coast providing key project interventions in marketing and technology, and it must be viewed as a major accomplishment for

the project to have succeeded where so many other programs have not dared to work, with the result being several successful interventions of direct benefit to the inhabitants of the Coast.

Lethal Yellowing Disease of Coconuts

The dramatic impact of lethal yellowing disease on Caribbean Coast coconuts. The "tall" variety of coconuts, most susceptible to the disease, is also the most prevalent on Nicaragua's Atlantic Coast.

Lethal yellowing of coconuts is a devastating disease that kills all non-resistant coconuts and palms, in particular the Atlantic tall coconut prevalent on the Atlantic Coast of Nicaragua. This plague has spread in recent decades from Jamaica to South Florida to Central America, and is now present in northern Honduras. It will eventually reach Nicaragua (via a common leafhopper as its vector) and when it does it will decimate the coconut groves of the RAAN and RAAS, affecting the livelihood of thousands of communities that depend on coconut for cooking oil, foodstuffs, and as kindling for cooking fires. Tourism will also be negatively impacted due to the death of the stereotypical coconut groves associated with tropical beaches. This is not a question of "if it happens" it is a question of "when" it will happen and what can be done to mitigate the impact.

ARAP worked in conjunction with IICA/USDA and MAG-FOR (Government of Nicaragua) to introduce germplasm that has shown resistance to the disease and to establish plantations along the northern area of the RAAN as a way of slowing the spread of the disease. Based on an analysis of ARAP-sponsored consultant Susanne Thienhause, a number of communities where pilot plantations could be planted were identified and a plan of action developed. The Atlantic Coast-based NGO FADCANIC was awarded a small grant to: 1) assist in the establishment and distribution of LYD-resistant seeds and seedlings; 2) provide area residents with informative seminars as to the disease and also as to systems of management of the new plantations; and 3) produce written material to be distributed to the communities along the coast, bearing information and pictures of the disease and where to report any sighting of such. This documentation and all presentations (written and verbal) were done in three languages: Spanish, English and Miskitu.

Plantation of LYD-resistant coconuts, community of Pahara, northeast Nicaragua. These new plantations will help maintain the food security condition of the Mayagna, Creole and Miskitu population, which uses coconut as a basic foodstuff.

The project initially established a target of five communities that would receive material by the end of the project. By leveraging additional resources, primarily from IICA and internal FADCANIC funds, ARAP was able to acquire significantly larger amounts of germplasm and was able to establish parcels with seeds and seedlings in 42 communities, 750 percent more than originally targeted. A truly multi-ethnic activity, the communities encompass Miskitu (17 villages), Mayagna (13 villages) and Mestizo (12 villages) beneficiaries located in 6 municipalities in the RAAN.

The total amounts of plants introduced, distributed and planted numbered 7,449, and were divided among hybrids, dwarf and pacific talls. A total of 10,202 seeds of pacific talls and dwarfs were also planted in nursery, bringing the total amount of seeds and seedlings to17,851. This amount of plants would correspond to a plantation of 78 hectares, or an estimated 20 percent of the total area already existing. The project exceeded its goals on the introduction of material by 250 percent, and FADCANIC, with their own funds, distributed an additional 1,500 seedlings to another 30 communities.

The last activity of this project was the inauguration of a ARAP/FADCANIC co-financed pollen collection and management lab located in Kukra Hill. This important development, the first of its kind in Nicaragua, will allow FADCANIC to increase the rate of reproduction of resistant varieties of coconut to replace those that will eventually succumb to LYD.

Note that as of the writing of this report (January 2002) Chemonics has received word that initial sightings of LYD-symptomatic illnesses in coconuts has been witnessed in north-central Nicaragua. It is urgent that USAID and MAG FOR move forward with their follow on project to continue to try to mitigate the impacts of this encroaching disease.

III. Project Design and Mechanisms

A. Introduction

ARAP was originally designed as a vehicle to facilitate the rapid replacement of productive assets that Nicaraguan farmers and ranchers lost when Hurricane Mitch devastated northern Nicaragua in October 1998. The scope of work for the RFP was a copy of USAID's Small Farmer Technical Assistance Activity and was oriented directly at fomenting production activities without taking into account market forces. Primary instruments to achieve this would be a financing facility known as a Special Activity Fund, which in practice was used as a pool of resources for financing grants, market development tours, subcontracts for specific goods and services; and a pool of work days that could be accessed to provide timely, specific technical assistance in market development, specialized production, post harvest and other areas.

Immediately upon signature of the initial contract, this agreement was modified to add additional resources, both for technical assistance and special activities. The focus of the project was modified such that Chemonics and its partner organizations were mandated to expand market opportunities for Mitch-zone producers. The team welcomed this modification as the market-oriented emphasis, while a *sine qua non* for sustainable increases of incomes for rural producers and the reduction of poverty, had not been a focus of recent agricultural programs in Nicaragua. Indeed, the country still suffers the effects of the disastrous policies of the 1980s, when the Government of Nicaragua controlled prices, production inputs were subsidized without thought to deleterious consequences on the national budget, and the agricultural sector eventually ground to a halt. The opportunity presented by USAID to develop real, market-justified activities in this initial amendment would have a lasting impact on how activities were programmed and initiatives taken.

A subsequent modification removed an additional focus on agricultural policy when it was noted that the intended subcontractor, Inter-American Institute for Cooperation in Agriculture (IICA), was a Public International Organization (PIO), and thus precluded by USAID regulations from working under subcontract with a U.S. firm. The money intended for this subcontract was reduced from the Chemonics budget and a separate stand-alone contract to IICA was awarded. Two additional modifications were formalized to re-align the work days ordered category estimates with the actual implementation, bringing the total number of modifications for the contract to four.

B. Project Implementation

B1. Level of Effort

The project relied first and foremost on its human resources to facilitate change and implement initiatives on the ground. The project used an innovative system of strategically based agribusiness promoters, individuals with relevant experience who worked from their homes, traveling to beneficiary's locations in the work zones located, in many instances, more than 10 hours away from Managua, the capital. ARAP also relied heavily on specific, timely short-term technical assistance providers, including Nicaraguan, Central American, Asian, European,

Australian and North American expertise. The structure of the project was built around two expatriate positions, the chief of party and the deputy chief of party. The remainder of the long-term staff in Managua was Nicaraguan professional and support positions.

For all labor categories the amount of person days contracted and delivered were as followed:

Type	Contracted	Delivered*	Percentage
Long-term expatriates	924 person days	882 person days	95%
Long-term local professionals	528 person days	4,639 person days	878%
Short term consultants	928 person days	1,626.5 person days	175%
Home office professionals	82 person days	385 person days	470%
Total Level of Effort	**2,462 person days**	**7,532.5 person days**	**305%**

* Estimated as of 31 December 2001, including modification no. 4.

As noted in the table above, ARAP ended up providing significantly more long-term local professional assistance, short-term technical assistance and targeted home-office professional assistance than originally programmed. This was the result of four separate modifications made to the ARAP budget to increase resources. Note that this was managed without a concomitant increase in long-term expatriate assistance, which was held stable at two positions, one for the life of the project (the chief of party) and the other at 18 months out of 24 (the deputy chief of party). In addition, ARAP relied extensively on Chemonics' marketing specialist Ricardo Frohmader to provide timely, recurrent technical assistance in market development and linkages. Based in Guatemala, ARAP was able to access Mr. Frohmader's services continually without incurring the associated costs of fielding an additional long-term North American position. The project instead used more Central American and Nicaraguan consultants than originally envisioned, which resulted in a more effective approach to working with local organizations and producers. Project consultants and Nicaraguan beneficiaries communicated better in their own language and shared backgrounds and experiences.

Key Questions for ARAP Market Studies

Whether there were better markets for existing production in terms of price, delivery terms, quality specifications, seasonality; and

Whether there were promising markets for products not currently under commercial-scale production but for which Nicaragua possessed a comparative and competitive advantage given prices of factors of production and market access conditions.

Based on the outcome of the market studies ARAP would then move to the next step, that of supporting marketing and/or production activities via sub-grants, technical assistance or other mechanisms.

In addition to assistance provided directly by Chemonics, substantial assistance was provided by other RAISE consortium members. In particular, Texas A&M and J.E. Austin & Associates made invaluable contributions to ARAP by providing high-quality short-term local and international technical assistance.

B2. Types and Nature of Technical Assistance

An advantage that ARAP had in dealing with technical assistance requirements was that USAID gave the project the flexibility to focus its resources on requirements as they arose without being

locked into specific assignments at specific times. Drawing upon a broad roster of experts with experience in the region, ARAP was able to select individuals to fill specific needs, providing timely, pointed assistance to Nicaraguan groups. Assignments varied as market studies sought ways to improve the fertilization of coffee as well as to develop financial and accounting systems for sub-grantees without formally defined management systems.

ARAP consultant leads a field day for protected cropping systems in Hurricane Mitch zone in central Nicaragua. A key accomplishment of ARAP was to move such technologies from theory to implementation, and to link them with market demands, in this case the demand for counter-seasonal vegetables for local markets.

Representative assignments carried out under ARAP included:

- Market development, ornamental palms and foliage for export
- Market development, cut flowers for North America
- Market development, Central American fresh produce and local institutional markets
- Market development, local market for cut flowers
- Market development, cashew
- Market development, regional dairy markets
- Market development, U.S. ethnic markets (Latino)
- Market development, organic produce for North America
- Market development, exotic tropical fruits
- Production guides, lychee and longan
- Production guides, ornamental horticulture
- Production guidelines, cashew
- Production guidelines, beef cattle in tropical zones
- Post-harvest handling, cold chain constraints
- Post-harvest handling, sweet onions
- Technology innovations, hoop tunnel technology
- Accounting and financial management for local organizations
- Best management practices for dairy plant operators

In addition, ARAP field promoter staff provided continuous technical assistance to sub-grantees, producer groups and other interested actors in market development, post harvest handling and production guidelines.

B3. Budget

The following budget shows the estimated final amounts to be invoiced to USAID. These are estimates as the December 2001 invoice was not yet prepared while this report was being written.

Estimated Final Amounts to be Invoiced to USAID	
Line Item	Final Budget as Amended*
Work Days Ordered	$ 2,488,841
Other Direct Costs	$ 4,117,035
General and Administrative	$ 192,166
Total	**$ 6,798,042**

*Including modification no. 4.

Given a broad mandate by USAID/Nicaragua and the flexibility to respond to different situations in different manners, ARAP mixed technical assistance, sub-grants, marketing trips, business development efforts, institutional strengthening, sponsoring of new institutions, and sponsorship of sales events to increase sales and income of producers in Hurricane Mitch-affected areas.

C. Sub-grants

Sub-grants were the principal mechanism for facilitating the direct transfer of productive assets and financing of non-ARAP technical assistance.

Sub-grantee	Project Description	Region	Number of Beneficiaries	Amount in $ (approximate)
Iglesia Maranatha	Reactivation, Cacao in Rio Grande de Matagalpa Watershed	RAAN/RAAS	446	91,000
Asociación Misión San Pablo de Tarso	Agriculture extension	Bonanza, RAAN	173	140,000
Escuela Católica de Agricultura y Ganadería de Estelí	Reactivation of potato production	Estelí	240	110,000
Association of Producers of Non-Traditional Agricultural Products APENN	Decorative Accessories: Handmade Paper, Ceramics and Stone Carvings	Nationwide	150	83,000
APEGARO	Livestock marketing and production	Rosita, RAAN	150	52,000
AGROPCSA	Sweet onion production for export	Matagalpa	129	75,000
Asociación de Mujeres en Desarrollo AMDES	Counter-seasonal vegetable production	Nueva Segovia and Madriz	150	14,000
Unión de Productores Agropecuarios de Nicaragua UPANIC/Cooperativa Sta. Ana	Livestock production and marketing	Chinandega	1,869	463,000
Universidad Nacional Agraria UNA	Fruit fly trials for pitahaya	Nationwide	350	34,000
Pueblos en Acción Comunitaria PAC	Tropical Fruit and Spice Production	Nueva Segovia	1,296	300,000
Pro Mundo Humano	Organic Cacao	Waslala	385	27,000
TELDSA	Honey Sector Study	León	150	4,000
Coop. Productores de Cardomomo	Organic Cardamon	Jinotega	37	20,000

Sub-grantee	Project Description	Region	Number of Beneficiaries	Amount in $ (approximate)
Fundación para el Desarrollo de La Costa Atlántica Nicaragüense FADCANIC	Lethal Yellowing Disease of Coconuts mitigation	RAAN	1,525	64,000
PAC	Tools and drought relief	León and Chinandega	2,000	16,000
PAC	Tools and drought relief	Nueva Segovia and Madriz	2,000	16,000
Cooperativa de Mujeres Productoras de Flores COJIMILF	Marketing and production of ornamental horticulture products	Jinotega	27	15,000
Cooperativa Multi-Sectorial del Norte 380 CONOR 380	Marketing, institutional strengthening of multi-sectoral agricultural cooperative	Nueva Segovia	847	402,000
Asociación de Mujeres en Desarrollo AMDES	Specialized coffee processing	Nueva Segovia and Madriz	100	19,000
Dairy Sector Initiatives	Market Development, Commercial Credit Access, Technology Improvements	Jinotega, Nueva Segovia, León, Matagalpa	5,982	n/a
Total			**18,006**	**$1,945,000**
Average Cost Per Beneficiary				**$108.01**

ARAP sub-grants covered a wide variety of activities. This is a reflection of the flexibility granted to the project by USAID to pursue targets of opportunity wherever they arose. Sub-grants ranged in size from $4,000 to over $400,000. The geographic area covered encompassed the entire designated damage zone of Hurricane Mitch, with projects in each of the departments impacted by the hurricane. They ranged across subject matter from organic cardamom for export to European markets to improved livestock marketing techniques for small farmers on Nicaragua's Atlantic Coast. They allowed producer groups not only to replace some lost assets, but to leverage project finances for critical areas such as market development assistance and other specialized services. The flexibility afforded ARAP by USAID Nicaragua in the direction of the sub-grant program was a key to the success of the project.

The sub-grant mechanism proved so successful in mobilizing resources that USAID used ARAP to respond to emergency situations not originally contemplated in the contract. A severe drought decimated basic grain production in western Nicaragua in early 2001. Coupled with historically low coffee prices, this caused many families to lose their source of seasonal cash income, and many families were facing an imminent food security crisis. The U.S. government responded with emergency food-for-work programs and approached ARAP for support. ARAP quickly entered into an additional sub-grant arrangement with Pueblos en Acción Comunitaria (PAC) to facilitate the purchase, transport and distribution of over 7,000 hand tools to groups working with CARE, PCI, Save the Children, and ADRA. This quick response mechanism allowed USAID Nicaragua to facilitate needed activities in a timely fashion, permitting vital food for work programs for more than 4,000 families to proceed without delay.

D. International Trade Shows

Part of the ARAP marketing strategy was to identify improved markets for existing production and/or identify underserved markets where Nicaragua could competitively enter and compete. A key to obtaining current marketing information and trends on an international level is attendance at industry-specific events. ARAP participated in several conferences and trade shows, each designed to meet a particular need on the part of project beneficiaries.

Industry-specific tours, such as this visit by Nicaraguan ornamental horticulture producers and retailers to the Ball/Pan American Seed Expo in Costa Rica, were instrumental in expanding the horizons of these producers in terms of new products and technologies that could be applied to the Nicaraguan domestic market.

Major trade shows attended included:

- Produce Marketing Association (PMA) Annual Conventions, 2000 and 2001
- Specialty Coffee Association of the Americas Annual Conventions, 2000 and 2001
- Grow Tech 2000
- High Point International Home Furnishings Show 2001
- New York Fancy Food Show 2000
- ALIMENTEXPO Costa Rica 2000
- EXPO Honduras 2000
- Costa Rica Floral Industry Program (Ball Seed) 2000

ARAP undertook these international tours because past experience has documented that they provide significant benefits in relation to the costs incurred. This is certainly the case for the PMA, where an investment of some $30,000 in travel and conference costs led to the inking of a deal that generated $900,000 in export onion sales. Other shows yielded valuable contacts and technological innovation (improved packaging technology from New York Fancy Food show incorporated into local pickled vegetable producer, improved potato seed identified at Grow Tech) and marketing strategies (High Point International Furnishing show). ARAP has shown that these investments, if carefully chosen and implemented, can have a positive impact on project beneficiaries. Indeed, as of the date of this report (January 2002) ARAP has received word that another contract for sweet onion exports has been signed between project-supported producers and an importer they met with at PMA 2001. This shows the continuing value of international marketing conferences and the contacts they engender.

E. Domestic Marketing Events

These events are important because they demonstrate firsthand to producers the importance and intricacies of marketing their produce/product/services to fellow Nicaraguans. They learned that only by marketing their goods will they be able to enjoy improved sales and incomes. In each of the events described below, the beneficiary groups and institutions came away with an enhanced understanding regarding the importance of marketing in their business activities.

EXPO-APENN III. This national show received significant ARAP financial support. A showcase for Nicaraguan products, it was attended by hundreds of visitors from Nicaragua, Central America and North America. APENN reports that, as a result, EXPO business deals valuing C$18,400,000 ($1.38 million) were made and over 2,500 market contacts registered.

The premiere international showcase for Nicaraguan products is EXPOAPENN. This show, which received vital support from ARAP for the 2001 exposition, allows international, regional and national business interests to showcase products and make business deals primarily in the areas of agriculture products. In this photograph AGROPACIFICO, a Chinandega-based chipping plant, demonstrates its product line. AGROPACIFICO later worked with ARAP to provide a market outlet for potato production from the Estelí area, providing growers with a firm market for their white potato production.

Bonanza Agricultural and Livestock Fair. Located in the small, remote town of Bonanza, RAAN, ARAP supported the first-of-its-kind livestock and produce sale to support a local institution and 12 local communities. This fair recorded C$56,000 in sales of grain and produce.

Rosita Agricultural and Livestock Fair. Located only 30 miles from Bonanza, ARAP supported the first-ever livestock and agricultural fair in Rosita. In addition to being a sales platform, the event allowed the ARAP-supported APEGARO to showcase new technology for cattle marketing (livestock scales) and genetic improvement (artificial insemination and electro-ejaculation). Reported sales were C$126,000 of livestock, produce, grains and dairy.

Quilalí Agricultural and Livestock Fair. Organized by CONOR 380 and supported by ARAP, the Quilalí fair served to showcase CONOR 380 goods and services, and reported sales of C$50,000.

UNIFLORA Ornamental Horticulture EXPO-VENTAS. ARAP and UNIFLORA worked together to sponsor four separate sales events in Managua to showcase the local cut flower, ornamental plant and landscaping industries. Sales from these events totaled an estimated C$1 million (U$75,000) and propelled the industry into the public eye, generating significant positive publicity.

F. Market Development Tours

Surveys on the Central American level of demand for a variety of Nicaraguan products showed significant demand in Honduras and El Salvador for Nicaraguan dairy products, in particular *morolique* cheese. Further analysis revealed that most of the final market was El Salvador, with much of the product passing through Honduras. An important aspect of the ARAP dairy marketing strategy was the formalization of commercial contacts with these neighboring countries. Product often was moved informally in bulk to unknown buyers, presenting difficulties in maintaining sanitary control and customs operations, putting at risk the health of the end consumer while reducing the return provided to the original producers.

ARAP first worked to meet market requirements by improving sanitation and obtaining official, formal certification for plants wishing to sell to neighboring countries (see Section D2 of this report, page 13). As a concurrent activity, ARAP worked with plant operators to identify mechanisms to reduce the steps needed for their product to reach final consumer markets. Dairy-specific trips to El Salvador and Honduras resulted in improved contact between plant and wholesaler, technological innovations such as mozzarella and provolone cheese produced in Nicaragua for the first time, and new product exports such as mozzarella to the Pizza Hut franchise in Honduras.

Negotiation and signature of purchase agreement, Keystone Marketing (USA) and the Torres Group, Nicaragua. ARAP support to this US business in its sourcing efforts was critical to the eventual successful signatures of contracts for marketing for the 2001 Nicaraguan sweet onion crop.

G. Publications

ARAP produced a number of stand-alone technical works designed to improve and increase productivity at the farm level. It also printed and distributed consultant reports to national and international groups working in Nicaragua, as well as interested individuals, private sector companies and producer associations. During the project over 1,600 documents were printed and distributed to over 69 institutions, 8 universities and a number of private individuals located in all sections of the country. Copies are also housed with APENN and are available for review and copying by the interested public as part of APENN's marketing library.

Examples of successful distributions include:

Reports to National and International Groups in Nicaragua		
Title	**Number Printed and Distributed**	**Author**
Tropical Feed Rations	500 copies	Guillermo Bendaña
Dairy Best Management Practices	250 copies	Raul Amador
Sweet Corn Production Guide	30 copies	Jesus Coto
Horticulture Production	30 copies	Jesus Coto
Cashew Production Manual	30 copies	Ian Duncan

These publications were each the first of their type in Nicaragua, directed specifically at conditions and regulations of the country. They will be a lasting legacy of ARAP's work.

H. Sourcing Visits

The project used the work of institutional demand specialist Carlos Azmitia as a guideline in undertaking measures to ensure that institutional buyers of fresh produce were aware of the time frame for products that were either under consideration for production or were actually being produced. The first step in this process was to establish formal contacts with the purchasing agents for the major supermarket chains operating out of Managua. The agents were invited to meet with ARAP professionals and with sub-grantees who were considering undertaking new crop innovations. The purchasing agents detailed to ARAP the quantities desired of a number of products, which the project then used as a basis for planning production activities. This was a key factor to ensuring that markets for the proposed products existed.

Targeted products included potatoes, onions, tomatoes, peppers and sweet corn for the domestic market. Targeted for international markets were such products as culinary herbs, sweet onions, diary products and exotic tropical fruits.

I. Market Information Systems

An outstanding legacy of ARAP is the installation and operation, in perpetuity, of a sophisticated, proven Market Price Information System. Originally designed by Chemonics for use in Honduras, this system, co-managed by APENN and the Fundación Hondureña de Investigación Agrícola (FHIA), reports and records on a daily basis prices from Managua's major markets for a variety of produce, grains and agricultural inputs. During the life of ARAP these prices were broadcast thrice daily to every part of Nicaragua, allowing producers to avoid having to rely on asymmetric information in dealing with brokers and intermediaries. This is the first time Nicaragua has had an accurate, verifiable system of price reporting that disseminated results on a nationwide scale. It is an accomplishment that ARAP, APENN and FHIA are justifiably proud of. APENN was also provided access to data from El Salvador and Honduras, allowing country-by-country comparisons of market data.

Radio Programming and Market Information

To ensure that the daily market prices collected by APENN reached the maximum amount of listeners, ARAP carried out an analysis of which radio programs had the largest audience among the targeted population of producers in Hurricane Mitch regions. After it was determined that the daily campesino show *Pancho Madrigal* had the most significant audience, APENN and ARAP placed the price reporting segments in this program.

The unique contractual arrangements made have ensured that this system of collecting data in Nicaragua will continue in perpetuity. APENN will be able to sell subscriptions for this information and utilize it for market studies. It is hoped that a significant private sector interest and subscriptions will be generated via APENN's marketing programs, allowing them to continue broadcasting this information on a daily basis nationwide.

IV. Successes and Impediments to Success

A. Introduction

This section covers critical factors that enabled the project to achieve its successes and identifies impediments that reduced the effectiveness of the project. It is meant to give credit where credit is due as well as point out factors that negatively impacted on project performance. Of the latter, factors both within and outside of ARAP's control are discussed.

B. Factors Contributing to the Success of the Project

What were some of the reasons ARAP worked well? Are the factors of success replicable in other projects in Nicaragua? These are important questions whose answers could guide future projects in the country. ARAP has identified several keys to success:

Team

The ARAP team must be given the credit for everyone's outstanding work over the course of the project. Selected for their technical prowess as well as their region-specific knowledge, they provided detailed insight on many regional and local groups and situations unique to the current USAID portfolio. By selecting people with regional background, ARAP avoided the Managua bias inherent in many development projects and allowed the promoters to leverage their technical expertise and local knowledge base.

The other key to successful implementation of ARAP was Chemonics International's home-office support. This Washington, D.C.-based team fielded dozens of short-term consultants from as far away as Europe and Australia. Home-office staff arranged for legal vetting of all agreement templates and provided invaluable guidance on critical project management issues. Significant, timely input was provided by our outstanding subcontractors on the RAISE IQC, in particular Texas A&M and J.E. Austin, who provided expert consultants on relatively short notice in response to ARAP demands.

Market Emphasis

Having an over-arching philosophy of market-driven agriculture development forced the ARAP team to become creative project designers and implementers. The market-led approach permitted projects to be analyzed initially under one unified criteria. Did a market exist for the product? Only if that answer was "yes" would ARAP move forward on subproject design and implementation.

Counterpart Agencies

ARAP was able to identify and work with a variety of counterpart agencies, associations and producer groups that were interested in change. Some of the least formalized, such as APEGARO (the Rosita Livestock Association), came through with the most original project ideas and were most responsive to ARAP guidance on implementation. In addition, ARAP worked with several groups unknown to USAID despite their long tenure. FADCANIC, an

Atlantic Coast-based development agency, is just one example. FADCANIC has existed for over a decade but until ARAP initiated contacts for its lethal yellowing disease of coconuts activity its profile in the Mission was non-existent.

This is not to say that more formally organized agencies did not prove to be excellent implementation mechanisms. Pueblos en Acción Comunitaria (PAC) is a case in point. With the support and tutelage of the large U.S. PVO World Relief, PAC is moving toward its goal of long-term sustainability. This partnering model is one that should receive support on the part of USAID as it allows for U.S. PVO expertise to be transferred to local groups in a systematic, organized manner. This is the case in terms of Cooperativa Santa Ana, which has entered into a post-ARAP partnership with Cooperative Resources International of Wisconsin, and Pro-Mundo Humano, which has garnered post-ARAP support from the German agency GTZ.

USAID Support

On the ARAP project USAID allowed ARAP to be both flexible and creative when it came to implementation. This was a key to the successes of ARAP.

Establishment of LYD-resistant coconut plantations, Wawa Bar, Atlantic Coast. An example of successful interagency cooperation (USAID, IICA/USDA, Government of Nicaragua) in a non-traditional activity, the LYD program had and will continue to have a positive impact on the populations of Nicaragua's Atlantic Coast.

Flexible. ARAP was allowed to pursue crops from cashews to onions, tomatoes, cheese, beef or any other product where there was a clear market justification for project involvement. The project was not limited to a previously determined set of commodities. USAID explicitly supported ARAP efforts to cover a broad base of activities, knowing that some would work well, some would not, but that without trying we would not be able to identify winners and provide them with additional support. For example, working with light industry/decorative accessories, an activity added at the mid-point of the project, was supported by the Mission even though there was a risk that the time frame would turn out to be too short.

Creative. Some problems required a creative approach outside the traditional experiences of USAID. Case in point is the advancement of lethal yellowing disease (LYD) of coconuts. This plague is devastating coconut trees on the Atlantic seaboard of Mexico and Central America, having pushed as far south as La Ceiba, Honduras. Though not strictly a market-driven activity, it does have significant food security implications for an historically under-served population, the Miskitu, Mayagna, Creole, Mestizo, Garifuna and Rama populations of the Atlantic Coast. USAID/Nicaragua seized the initiative and tasked ARAP with developing a comprehensive program to slow the onset of this disease. A dynamic, fast-moving program to both introduce resistant stock to the area plus a comprehensive educational campaign with educational materials in English, Spanish, and Miskitu, has brought together IICA, USAID, USDA, Government of

Nicaragua, and several local Atlantic Coast NGOs in an effort to mitigate the probable impact of this disease. The bringing together of such disparate groups is a tribute to the creativity USAID allowed in implementation of the project.

C. Impediments to Success

Relief/Development Dichotomy and Geographic restrictions. In the aftermath of severe natural phenomenon such as Hurricane Mitch, there is an understandable desire to do anything to help people who have lost productive assets, housing, even the lives of family members. ARAP was endowed with a Special Activities fund of $2.8 million to work with the agriculture sector. This significant sum of money needed to be moved in an expeditious manner as USAID had until 31 December 2001 to expend the funds. While decisions cannot be said to have been rushed, the time pressure to move funds was constant and often distracted ARAP's professional staff from their primary goal of having a positive development impact through market access and technical assistance.

The geographic restrictions also led to some frustration and possible missed opportunities. While it is certainly correct that Hurricane Mitch had greater impact in some departments than others, in reality many zones were seriously damaged by the storm. On more than one occasion, ARAP encountered well thought out project ideas that had to be rejected because they would take place in a department that, while suffering from storm damage, was outside the official boundaries for USAID assistance. A mechanism for a case-by-case determination of geographic appropriateness would have facilitated the directing of ARAP assistance to those areas which demonstrated need and storm damage.

Time Frame

It is simply insufficient to only have two years in which to carry out broad-based market led agricultural development. Given that only so many planting cycles fit in to a year, coupled with the time many higher-value crops take to mature, often more than two years (for example, cashew), a much longer time frame would have been preferred. The most successful agricultural project in the USAID portfolio of experiences have been between 7 and 10 years in duration (for example, PROEXAG/EXITOS). Follow-on work must take into consideration that Mother Nature cannot be rushed.

Policy Environment

ARAP was just one project with limited scope, duration and budget. While it achieved outstanding results, unless and until the Government of Nicaragua addresses several fundamental structural issues negatively impacting on the agriculture sector, the replication and expansion of these successes will be limited.

- *Credit.* The agricultural credit situation in Nicaragua is in complete disarray. The excessive amounts of subsidized credit extended the sector in the 1980s were followed in the 1990s by a significant shrinkage in funds available, as private banks moved toward financing of trade goods and business opportunities with a shorter time frame and greater profit potentiality than agriculture. The closure of the National Development Bank and the collapse of several pyramid schemes relating to coffee financing left many farmers without access to financing of any type. Combined with lingering land tenure issues (see below), this has restricted the expansion of the sector and caused a reliance on politically driven quick-fixes that resolve some of the most immediate pressing needs but do nothing to address existing debts, profitability of operations, and so forth. ARAP did not work in credit programs but recognizes that, if the sector is to grow in a sustainable manner, a functioning financial system that finances profitable operations is a necessity.

- *Land Tenure.* A clearly defined and impartially enforced property rights regime is a sine qua non for a country to develop. This is a particularly sensitive issue for Nicaragua given the left over property disputes from the 1980s and the continuing inability of the Government of Nicaragua to resolve outstanding property claims from U.S. citizens. Lenders require collateral as a way of reducing their risk. When politically connected landowners avoid repossession of property, bankers do not lend and investors do not invest or only limit their investment to contract farming and sourcing, placing most of the risk on the small farmers who are least able to bear it. Until and unless the land tenure situation in Nicaragua is resolved, it will continue to act as a drag on the development of the agriculture sector.

- *Import restrictions in the United States.* When it comes to imports from developing countries such as Nicaragua, the purpose of USDA is not to facilitate imports of agricultural products, but to protect U.S. agriculture from foreign pests and diseases. With this in mind, any project that seeks to increase exports of perishable products from a country such as Nicaragua to the United States must keep in mind that if the product is not explicitly permitted from a given country, then it is non-admissible into the United States. The admissibility process can take up to five years, if not longer. Keeping this in mind ARAP focused relatively little energy on acquiring permission for additional Nicaraguan products (with the exception of the still pending pitahaya protocol). USAID/Washington should pursue greater collaboration with USDA to address this issue.

Note that these three areas are all within the purview of USAID to influence through its existing programs or through new initiatives. As these are key bottlenecks to increasing economic opportunity for the affected populations, USAID should make them priority issues.

Transportation Infrastructure

A key competitive disadvantage to Nicaraguan exporters is the lack of adequate port facilities on the Eastern (Caribbean) coast. Exporters who wish to ship containers to the major markets of the

U.S. East Coast must transship via Puerto Cortez in Honduras or Puerto Limon in Costa Rica. Either option adds a minimum of $800 per container. As world agriculture becomes ever more competitive, Nicaragua ends up at a serious disadvantage compared with neighboring Central American countries with direct access to Atlantic Coast port facilities. If Nicaragua is ever to develop its Atlantic Coast zone and support a more export-oriented economy, it will need to make the required highway and port infrastructure investments. If not, the country it will continue to be at a competitive disadvantage.

In addition ARAP consultant David Picha identified several problems in the nationwide cold chain that are hindering the development of a more advanced fresh produce industry. These results, shared with USAID and APENN, point out additional obstacles that must be overcome for the sector to fully develop its potential.

Counterpart Weaknesses

ECAGE potato project in action, Estelí. ECAGE is an example of a highly organized, results-oriented, private sector educational institution. ECAGE was an excellent counterpart, in contrast to the example of the UNA, the public sector agriculture university in Managua. It is critical that the private sector be brought in to the greatest degree possible if positive, sustainable changes are to be brought to the Nicaraguan agricultural sector.

The key to successful sub-grant implementation is a dedicated counterpart agency. Most ARAP worked with proved to be excellent partners; however, on certain occasions USAID suggested to ARAP that a particular group had developed a proposal that the Mission thought deserved the project's close consideration. While USAID did not direct ARAP to work with any particular group, the project did its best to meet Mission expectations. Unfortunately, this led to several instances where sub-grantees felt that they were entitled to communicate directly with USAID on project issues, hampering the ability of ARAP to manage its activities. Though these cases were all resolved, it did lead to an unnecessary expenditure of time and effort.

USAID Administrative Procedures and Policies

While the level of cooperation and support extended by USAID to the contractor was significant and contributed greatly to the successes of ARAP, there were three principal areas where USAID did create impediments to the efficient functioning of the contract.

Approvals process

At the beginning of the project, there was considerable confusion regarding the approvals process on the part of USAID. It was not made clear to the first CTO what he had the authority to sign, and as a result important consultancies and studies were delayed and in some cases

cancelled while the appropriateness of certain consultancies and consultants was discussed between up to four different USAID/Nicaragua professional staff.

Delays in one case led to the cancellation of an assignment after approval for salary, technical clearance, and terms of reference had been obtained and a country clearance cable issued for consultant travel. This led to significant personal disruption for a valued professional and also deprived ARAP of a much-anticipated study. Subsequent discussions with USAID did not provide a clear rationale for the decision and led to confusion on the part of the project as to whether or not assignments approved by the CTO would always be in danger of being overturned by superiors.

Results: PAC beneficiary receives improved planting material that will provide future income-generating opportunities in tropical fruit sector. ARAP worked to support PAC in providing these opportunities to poor and isolated Hurricane Mitch-affected populations.

Finally, the initial project CTO was not sufficiently trained or organized to handle the volume of approvals that a short-term, high-budget contract generates. On numerous occasions approvals were misplaced, both for consultancies and for grants. This led to a significant loss of time to the project, already operating on a short 24-month project life.

In light of these situations, it is strongly suggested that new CTOs undergo relevant training prior to their assignment to new contracts. This is the only fair way to ensure that they know their level of decision-making authority and can interact comfortably with contractors without having to worry about making administrative mis-steps.

Political considerations and sub-grantees

ARAP was never directed to do business with a specific sub-grantee. However, on at least one occasion, it was strongly suggested that a particular group was deserving of ARAP's attention due to Embassy interest. This led to an unfortunate incident in which the sub-grantee was subsequently cut off from ARAP funding, resulting in significant lost staff time and energy in documenting mis- and malfeasance on the part of the beneficiary institution and defending itself against frivolous charges brought against the project.

A second case in point was the close relationship between sub-grantees and the USAID Mission itself. In this case ARAP attempted to modify an existing sub-grant that would have implied a shifting of resources due to slow execution on the part of the sub-grantee. Instead of working through the established procedures, the sub-grantee went directly to the USAID project office, where it pled its case without ARAP's knowledge. Though ARAP and the sub-grantee eventually reached an amicable resolution to the case, USAID should not have allowed the project's negotiating authority to be undermined.

Special activity requests

Despite having a formal work-plan and course of action, ARAP often was requested by USAID to provide rapid assistance to specialized activities that the project did not view as within the scope of its mandate to assist in the recovery of agriculture from the effects of Hurricane Mitch. Two examples stand out: 1) the funding of two businessmen to the Economic Forum of the Americas in Buenos Aires, Argentina; and 2) the funding of a coffee producer to attend a regional coffee meeting in Bogotá, Colombia. In both cases the perceived benefit to ARAP was minimal, causing the sensation that the project was being used as a type of petty cash fund to finance individual initiatives outside the interest of ARAP. In neither case did the activities contribute to furthering the project's stated goals.

Despite these bumps in the road, it is important to note that during the course of year 2 of ARAP the processes and relationships between the project and the Mission improved significantly, and ARAP and USAID were able to move expeditiously on a number of important initiatives and consultancies. Nonetheless, there were significant delays and expenditures of staff time and effort to meet many of USAID's special requests.

Internal ARAP Management Issues

Within ARAP there were certain issues that acted against the project working as efficiently and effectively as it could. The turnover in a key professional position (marketing expert) slowed our ability to identify and react to new opportunities. At times communication between the field office and Mission staff was poor or unclear, impacting on the decision-making process. ARAP also had to deal with matching the technical and managerial needs of the project with the staff selected for project implementation, in particular given the change in focus from production to marketing early on in the project. While these issues were worked through and eventually resolved, they distracted from the primary purpose of the project.

Despite external and internal difficulties, in conclusion there were many factors which combined to make ARAP a success. The impediments to success were in most cases overcome or anticipated, and did not significantly detract from the overall quality of the project's work.

The ARAP team

IV. Conclusions and Recommendations

A. Introduction

In conclusion, it is fair to say that ARAP was a success. The project met or exceeded targets in terms of beneficiaries and sales, opened up numerous marketing opportunities, both domestic and internationally, sponsored a number of new crops and technological innovations, and made a positive impact on people hit hard by Hurricane Mitch. Given the very short time frame involved, ARAP is proud of its accomplishments. It is logical to ask the question of "What should come next?" and this section will briefly lay out three recommendations for USAID Nicaragua to consider in its dealings with the agriculture sector and rural development in Nicaragua.

B. Recommendations

The following recommendations are made with the goal of possibly guiding future USAID programming for Nicaragua's agriculture sector to increase incomes and reduce poverty.

1. *Maintain strategic framework of market-led activities.* This approach is key if the agriculture sector is to grow in a sustainable manner. By focusing on what people will buy and not on what farmers can produce new projects and initiatives can ensure that there are real markets and real opportunities for farmers to make money and move out of poverty. While this will imply a significant shift in Government of Nicaragua policy (which to date is still focused on poverty crops such as basic grains), it is the only way that the sector can move forward. Without a market-based approach to agricultural development, new initiatives will not succeed and resources will be wasted.

2. *Leverage existing work, focusing on successes.* ARAP has left behind a legacy of projects and initiatives. Many of these are continuing post-ARAP with minimal formal support from outside agencies. USAID has an opportunity to pick and choose from a wide range of successful interventions and design follow-on activities to support them for the next several years. Dairy, cashew/exotic tropical fruits, and high-value horticulture are but three examples where the opportunity to continue ARAP-initiated work would require relatively little in terms of expenditures but would have significant impact on the sector and its ability to generate income and reduce rural poverty. To avoid re-inventing the wheel, the Mission is urged to make use of the work done by ARAP when planning future interventions.

3. *Maintain a nationwide focus and allow for sufficient time frame to see long-term results.* Regardless of the interventions designed it is crucial that the Mission allow for an adequate time frame for the projects to see long-term results. As noted earlier, most successful agriculture projects have a minimum time frame of five to seven years, which should be a guide for possible timelines for future activities. In addition, the Mission must allow the follow-on activities to take place on a nationwide scale. Certain areas of Nicaragua possess comparative advantages in terms of water, land and labor endowments. These should be exploited to the greatest degree possible to allow for the most efficient uses of scarce development assistance funding. It would also allow for innovative programs to work in under-served areas of the country, such as the Atlantic Coast.

C. Conclusion

ARAP's greatest successes are still to come. The project's most enduring legacy, the establishment and strengthening of market linkages, is a person-to-person activity that has created sustainable relationships that will endure long after ARAP's closure. This is reflected in the continuing sales made by ARAP-supported sub-grantees in areas such as onions, dairy, and cacao in the months since ARAP ended, and which can be expected to continue to show successes well into the future.

Like the Ubeda family, beneficiaries are building a new future under the ARAP/PAC tropical fruit project in San José de Bocay. Work here will lead to increased sales and income-generating opportunities for them and their children long after ARAP has ended.

ARAP has also left behind an enduring legacy of activities that can provide USAID and other interested donors with a wealth of potential activities that can have great future benefits for Nicaraguan farmers and the rural sector of the country. It is hoped that the Mission will make full and fruitful use of the work done to date in planning for future interventions.